

MITCHELLS OVER THE PACIFIC:
THE DYNAMICS OF B-25 INNOVATION

BY
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The undersigned certify that this thesis meets master's-level standards of research, argumentation, and expression.

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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

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ABSTRACT

This study is a historical analysis of the innovative genius leading to B-25 modifications in the Southwest Pacific Theater during World War II. The writer begins by outlining the B-25 manufacturer's path of development from the B-25 prototype through the final B-25J models. This establishes a baseline of aircraft development before focusing on two individuals in the Southwest Pacific Theater. Next, the writer analyzes the top-down innovation and leadership of General George C. Kenney. Kenney played a crucial role in fostering the environment where innovative genius could bubble up from lower echelons and have strategic effects during engagements like the Battle of the Bismarck Sea. Finally, the author focuses on the bottom-up innovations of Major Paul I. "Pappy" Gunn. Gunn provides the "can-do" attitude, mechanical capability, and innovative genius that first spurred innovations in the A-20 Havoc and later in the B-25 "commerce destroyer." This study concludes by analyzing the contributions from the actors in the previous three sections. It indicates that each actor had an important role in B-25 development, but the real source of the innovation was the combination of factors. Most importantly, Kenney's leadership fostered an environment where innovation could grow, while he protected the innovators in the lower levels of his organization. One of these innovators was Gunn, whose enterprising actions culminated in the successful modification of the B-25 and turned the war in favor of the Allies after the Battle of the Bismarck Sea.

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Introduction



Figure 1: B-25J Formation

Source: Warbird Central, "Stinky: 43-27942 – B-25J-5-NC," <http://warbird-central.com/2011/01/b-25-serial-43-27942/> (accessed 14 April 2013).

(Note: Author's grandfather flew in the far left aircraft through the end of World War II.)

Innovative thinking played a critical role in the Allied victory in the Southwest Pacific Theater during World War II. The B-25 Mitchell medium bomber underwent a metamorphosis during the first few years of World War II, transforming it from a medium and high-altitude bombing platform to a low altitude strafing and skip-bombing commerce destroyer. Writers and historians often attribute the successes in the Southwest Pacific Theater to the dynamic leadership and smart innovation of General George C. Kenney. This perspective,

while appropriate in many ways, neglects the impacts of exceptional thinkers and engineers working at the unit level. One of these individuals was Major Paul I. “Pappy” Gunn, whose unique leadership attributes, innovative thinking, and drive for action influenced both Pacific Theater operational practice and B-25 manufacturing from the beginning of the war in 1941 to the dropping of the atomic bombs in 1945. The following pages focus on B-25 manufacturing and field modifications, viewed through the complementary lenses of General Kenney’s leadership and Pappy Gunn’s drive to build the perfect machine with which to attack the Japanese.

The United States (US) entered World War II (WWII) in the Pacific Theater with a medium bomber designed in the 1930s. The Army Air Corps¹ (AAC) ordered the initial 184 medium bombers on 10 August 1939 and designated them the B-25 Mitchell, named in honor of the late airpower prophet.² Even before the US entered WWII, the AAC observed aerial warfare over Europe and began modifying the B-25 to increase its self-defense capability. The B-25B was the version employed by the Army Air Forces (AAF) during its first offensive action of the war in the Pacific Theater.³

On 18 April 1942, sixteen B-25B Mitchell bombers made history when they took off from the deck of the aircraft carrier *USS Hornet* and bombed Tokyo, Japan. These bombers were specially modified versions of the B-25B, which first flew in April or May of 1941.⁴ The B-25B was a medium bomber with a 3,000-pound bomb load. It included a defensive armament of four .50-caliber machine guns, two

¹ Note: The air arm of the US Army was the Army Air Corps from 2 July 1926 through 20 June 1941. From this date through 18 September 1947 it was designated the Army Air Forces. On 18 September 1947 the US Air Force became a separate service under the National Security Act of 1947.

² David Doyle, *B-25 Mitchell in Action* (Carrollton, TX: Squadron/Signal Publications, 2011), 5.

³ Doyle, 16.

⁴ Doyle, 10.

each in a Bendix power-operated turret on top and below the aircraft. Though the Army believed this model possessed adequate capability, the US Army tasked North American Aviation to build five different variants of the B-25, each with upgraded capability.

At the conclusion of the war in the Pacific, North American was producing the B-25J model. The B-25J could strafe with up to 14 machine guns while approaching the bombardier's target.⁵ The innovation transforming the B-25 from a medium high-altitude bomber to a strafing and low-altitude bombing commerce destroyer did not come from North American Aviation alone. Nor was it directed by high-level civilian or military leadership. It was innovated in the field in response to the needs of the Airmen, their changing mission, and the demands of the theater of operations.

Military innovation during wartime is a complex undertaking. Stephen Rosen believes military innovators should focus on peacetime innovation because "wartime innovation is so terribly difficult."⁶ WWII provided a unique opportunity for airpower innovation, both in terms of quality and quantity. This carried on a tradition found in the air forces of World War I. During the First World War, innovative designs from the manufacturer, front line units, and even the enemy helped airpower evolve to meet the demands of combat.⁷ The Japanese Pearl Harbor attack on 7 December 1941 provided the impetus for increases in US aircraft production as well as an opportunity to improve aircraft designs to match the superior Japanese aircraft. The AAF innovated during World War II and airpower continued to evolve, much as it had done during World War I. The path from the aircraft of World War I to those of World War II was possible because the AAC combined reliance on existing doctrine with the development of

⁵ Doyle, 64.

⁶ Stephen Peter Rosen, *Winning the Next War* (Ithaca, NY: Cornell University Press, 1991), 182.

⁷ Lee B. Kennett, *The First Air War 1914-1918* (New York: Simon & Schuster, 1999), 98.

innovative new methods in combat. The benefit of wartime innovation is that “not as much time is needed to overcome the kind of organizational resistance normally found in peacetime.”⁸

Rosen argues that decentralization facilitates innovation in circumstances such as the AAF faced in WWII. He suggests, “the operating units can collect all the relevant data themselves and can execute the innovation without the need for organizational changes elsewhere in their service.”⁹ The early years of the Pacific war provided just this type of environment. Within Rosen’s theory, Airmen, left to their own initiative in a somewhat backwater war theater, and operating under supportive (or at least permissive) leadership, adapted the B-25 from a medium bomber to a formidable strafing and bombing platform.

The time required to innovate is more critical in wartime than in peacetime. In the middle of a war, leaders must find the solutions to their problems in minimum time if they are to be of any use at all.¹⁰ The organization itself becomes the barrier to innovation. An ad-hoc organizational process streamlined the B-25’s development cycle. Airmen were critical in the evolution of the B-25. They found themselves in a situation where their existing tactics, techniques, and procedures were not working.

The B-25 needed a new mission and new capabilities to achieve the successes it found as the war wore on. However, the Airmen in the Pacific Theater were in a precarious position. The US plan prior to Pearl Harbor was to focus on the European theater. Initial actions in the Pacific Theater would be defensive.¹¹ This meant sending equipment and supplies to Europe first, initially leading to severe

⁸ Rosen, *Winning the Next War*, 23, 181.

⁹ Rosen, *Winning the Next War*, 39.

¹⁰ Rosen, *Winning the Next War*, 22.

¹¹ USSBS, 56.

shortages in aircraft in the Pacific Theater.¹² Airmen were forced to devise new solutions to their problems and cannibalize some aircraft to ensure others were operational. In one case, they even went to find downed aircraft to salvage as much as possible from the broken remains.¹³ This type of ingenuity lies outside traditional military organization and procedures. Smart Airmen took advantage of the lack of support and innovated in the field to create changes to the B-25 airframe to increase their mission effectiveness.

Barry Posen offers an alternative theory. Posen suggests organizations only innovate when they fail, when pressured from the outside (from civilian oversight in this case), or when they need to expand. Furthermore, an organization will resist innovation outside these circumstances unless a new technology is combat tested first.¹⁴ If Posen's argument is valid for the Southwest Pacific theater, then one will find evidence of organizational resistance to change in the Allied Air Forces. Furthermore, a military maverick teaming with a civilian outsider who has power over the military organization may explain the development of the B-25.

Given that Airmen were significant innovators in the transformation of the B-25 from a high-altitude medium bomber to a low altitude strafing and bombing platform, this thesis asks one central question: What were the sources of innovation within the B-25 force in the Pacific Theater during WWII? The following chapters provide a historical analysis of B-25 development and operations in the Pacific Theater. Other works attribute the development and success of the low altitude bombing and strafing techniques to the leadership of the Commander, Fifth Air Force, General George

¹² William M. Leary, *We Shall Return! MacArthur's Commanders and the Defeat of Japan* (Lexington, KY: University Press of Kentucky, 1988), 88.

¹³ George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan, and Pearce, 1949), 71-73.

¹⁴ Posen, *Sources of Military Doctrine*, 47, 59.

Kenney. There are few writings about the innovation conducted by Airmen at the unit level. This thesis chronicles the evolution of the B-25 and tells the story of these units and Airmen implementing General Kenney's strategy with their specially adapted B-25s. This thesis departs from a top-down view of innovation and analyzes the strategic impact of innovation bubbling up from the unit level. The focus on unit-level Airmen explicates the ways tactical innovation created strategic impact in the Pacific during WWII.

The examination begins with a description of the B-25 models as they came off the North American Aviation assembly line. This establishes a baseline for examining the wartime modifications to the aircraft. A discussion follows about the "top-down" innovation spawned by General George Kenney and the "bottom-up" innovation of his chief engineer Major Paul I. "Pappy" Gunn. This represents the sum of the technological changes supported by the leadership and conducted within the theater. The final chapter compares B-25 modifications from the perspective of the manufacturer, the air commander, and the unit level pilot and maintenance officer. It reveals the complex path of innovation from several sources throughout the war. Throughout these chapters, comparisons are made to the factory production of the aircraft in an attempt to mesh theater innovation with the eventual adaptation of the aircraft on the assembly lines. This study concludes by comparing the influence of Kenney's top-down innovation with Gunn's bottom-up innovation and acknowledging the ways their actions worked in concert with North American Aviation Corporation's manufacturing process.

Chapter 1

B-25 Models and the North American Aviation Assembly Line

This chapter establishes a technological baseline through an examination of the basic B-25 production models. This discussion is required to develop an understanding of how the aircraft were constructed, how they evolved, and the differences between the models. After explaining the development of the B-25, the remaining chapters discuss the influences on the production process and the genesis of the innovative ideas leading to the rapidly changing B-25 Mitchell.

Before describing the aircraft itself, it is important to understand the AAC's basic thinking regarding the mission and role of bomber and attack aviation. US Airmen first employed attack aviation in the closing months of World War I.¹ Attack aviation encompasses modern missions such as close air support and interdiction. In the interwar years, however, the AAC drifted away from attack aviation. This period was also a time where the AAC consciously made efforts toward establishing itself as a separate service.² The Air Corps Tactical School (ACTS) was the center for doctrinal development during this period. By 1926, ACTS texts began to refer to air operations as on par with Army and Navy operations and discussed attacking the enemy's interior areas rather than targets within the battlefield itself. Furthermore, the promise of new aircraft such as the B-17 stimulated Airmen to think about the strategic effects of air operations.³

¹ Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm: 1917-1941* (Maxwell AFB, AL: Historical Division, Research Studies Institute, Air University, 1955), 12.

² Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing: 1914-1945* (Princeton, NJ: Princeton University Press, 2002), 135, 156; Matthew K. Rodman, *A War of Their Own: Bombers Over the Southwest Pacific* (Maxwell AFB, AL: Air University Press, 2006), 4, 6.

³ Greer, *Development of Air Doctrine*, 47-48.

Early ACTS ideas came from the ideas and writings of Generals William “Billy” Mitchell and Giulio Douhet. An ACTS course text from 1934 suggests national morale and industry were more critical and lucrative targets than enemy ground forces. ACTS, however, moved beyond Mitchell and Douhet’s theories and focused more specifically on critical systems and infrastructure rather than area bombing.⁴ The theory proposed by ACTS suggests a decisive victory could be gained not by destroying an enemy’s forces, “but by the destruction of its belief in ultimate victory and its will to win.”⁵ Attack aviation, however, did not disappear from the ACTS curriculum. Captain George C. Kenney, an ACTS instructor from 1926 to 1929, focused on attack aviation in his instruction and it became one of his greatest interests.⁶

Despite advocates such as Kenney, attack aviation received decreasing support as the AAC strove to become an independent service. Unlike strategic bombing, attack aviation did not advance the cause of a separate service, but instead threatened to subsume airpower further within the Army. By the 1930s, ACTS began advocating for strategic bombing over all other air roles to include attack and pursuit aviation.⁷ A 1930 ACTS text states, “The air force does not attack objectives on the battlefield or in the immediate proximity thereof, except in most unusual circumstances.”⁸ There were other, experience-based, reasons for shifting away from the low-altitude attack aviation tactics besides the ACTS newfound precision bombing theory. World War I experiences with high casualty rates decreased the Airmen’s enthusiasm for low-altitude

⁴ Greer, *Development of Air Doctrine*, 51, 57.

⁵ Biddle, *Rhetoric and Reality*, 139-140, 160.

⁶ Hugh N. Ahmann, Maj Gen Eugene L. Eubank Oral History Interview, USAF Historical Research Agency, K239.0512.1345, 51; Greer, *Development of Air Doctrine*, 66; Lee Kennett, “Developments to 1939,” in *Case Studies in the Development of Close Air Support*, ed. Benjamin Franklin Cooling (Washington DC: Office of Air Force History, 1990), 46; George C. Kenney, “Attack Aviation” (lecture, Air Corps Tactical School, Langley Field, VA, 1927-1928), USAF Historical Research Agency (HRA), 248.2201B-1; Rodman, *A War of Their Own*, 5-6.

⁷ Biddle, *Rhetoric and Reality*, 164; Greer, *Development of Air Doctrine*, 66-67.

⁸ Kennett, “Developments to 1939,” 47.

missions.⁹ Other nations, including Great Britain, also looked toward strategic bombing as a solution to problems encountered in World War I. Furthermore, anti-aircraft defenses were improving, putting aircrews at greater risk. Promises of new bombers capable of flying higher, at faster speeds, and delivering bombs that were more effective with improved bombsights provided an opportunity to escape the risks of low-altitude attack.¹⁰ Thus, the AAC had several reasons for stepping away from low-altitude attack aviation and embracing high-altitude precision bombing. The high-altitude precision bombing was a more survivable tactic, while establishing an independent and unique wartime role for the AAC.

Importantly, the AAC (and the Army Air Service before it) studied the effects of bombing on ships extensively after World War I. From 1921 to 1927 there were many tests revealing ships' vulnerabilities to air bombardment.¹¹ Furthermore, an ACTS report from 1938 describes aerial bombardment as more effective than ship based weapons. While the assessment assumed only five percent of the bombs scored direct hits on the ship, the significantly larger explosive charge of a 2,000 pound bomb compared to a 14 or 16-inch shell made up for the lack of accuracy.¹² The report concluded that the 2,000 pound bomb had a "greater potential destructive effect against battleships than any other known weapon."¹³ Despite the positive review of air bombardment against ships, the report cited a need to develop better bombing techniques to improve accuracy while bombing from high altitudes.¹⁴

In September 1939, the AAC moved further from low-altitude attack aviation when the Air Board removed the attack aircraft from its

⁹ Kennett, "Developments to 1939," 3.

¹⁰ Biddle, *Rhetoric and Reality*, 167, 172; Greer, *Development of Air Doctrine*, 122; Rodman, *A War of Their Own*, 8.

¹¹ Ahmann, Eubank Oral History Interview, 50-53; Rodman, *A War of their Own*, 8; John G. Williams, "A Bomb Sight View of the Red Navy" (Maxwell Field, AL: Air Corps Tactical School, 1937-1938), 8.

¹² Williams, "A Bomb Sight View of the Red Navy," 10.

¹³ Williams, "A Bomb Sight View of the Red Navy," 36.

¹⁴ Williams, "A Bomb Sight View of the Red Navy," 37.

list of requirements. Some individuals believed, incorrectly, that lessons from the war in Spain suggested low-altitude tactics were ineffective. In the fall of 1941, however, experiences in Russia revived interest in attack aircraft and tactics.¹⁵ The renewed interest, however, did not reveal itself in one of the most important air planning documents at the beginning of World War II.

In July 1941, the Air War Plans Division (AWPD) received a tasking to support the War Department's War Plans Division. President Franklin Roosevelt had asked for an assessment of the logistics and production requirements for the impending war. This effort led to a document called AWPD/1, or Air War Plans Division Plan 1. While writing the document, the air staff "tacitly assumed a position of equality with the Army and Navy staffs."¹⁶ According to the document, the air plan in Europe would be offensive (meaning strategic bombing), and ground-support attack aviation was a secondary mission, to be executed only in the event of a ground invasion.¹⁷ Furthermore, the document defined assets required for this mission. One of these assets was the B-25. AWPD/1 became the primary air-planning document for World War II.¹⁸ Thus, the AAC moved away from attack aviation and its theories and plans supported independent bombing operations beyond the battlefield. Aircraft like the B-25 entered the war as medium and high-altitude bombers. In this role they could execute independent missions, supporting the argument for

¹⁵ Greer, *Development of Air Doctrine*, 122.

¹⁶ Conrad C. Crane, *Bombs, Cities, and Civilians: American Airpower Strategy in World War II* (Lawrence, KS: University Press of Kansas, 1993), 24; Greer, *Development of Air Doctrine*, 124.

¹⁷ Chief of Staff Memorandum, in Air War Plans Division (AWPD) 1, *Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies*, part 2, 1 August 1941, USAF Historical Research Agency, 145.82-1, 1; General Henry H. Arnold to Lieutenant General George C. Kenney, letter, 5 July 1943, in Papers, George C. Kenney, USAF Historical Research Agency, MICFILM 27132, frame 150; Greer, *Development of Air Doctrine*, 125; Rodman, *A War of Their Own*, 10.

¹⁸ Chief of Staff Memorandum, in Air War Plans Division (AWPD) 1, *Munitions Requirements of the Army Air Forces to Defeat Our Potential Enemies*, part 2, 1 August 1941, USAF Historical Research Agency, 145.82-1, 3

an independent Air Force. Only later would these aircraft be adapted to the unique requirements of the Pacific Theater.

The discussions about the roles and functions of airpower did not end with the start of World War II. They continued throughout the war. On 21 July 1943, the War Department published Field Manual (FM) 100-20. This document solidified several airpower tenets. First, it established air superiority as a fundamental requirement for the success of any major land operation. It also clarified command relationships. The “control of available air power must be centralized and command must be exercised through the air force commander.” The theater commander exercises his command of theater air operations through the air force commander.¹⁹ FM 100-20 also identified the five different types of aviation available to the air commander: bombardment, fighter (air-to-air and ground attack fighters), reconnaissance, photographic, and troop carriers.²⁰

The manual continued by establishing priorities and missions for the different aircraft. Heavy bombers with the support of fighter escorts and photographic reconnaissance aircraft comprised the strategic air forces. As the name implies, these forces operated beyond the theater level in support of the larger war plan. Conversely, tactical air forces fought with ground forces within a theater.²¹ Importantly, tactical air forces did not serve the ground forces; they were considered a theater asset. These forces included light and medium bombers, reconnaissance aircraft, fighters, and an aircraft warning service. Theater air forces had three basic priorities. First, they sought air superiority to a degree that allowed air and ground forces to operate freely. The second priority was similar to modern interdiction. They attacked lines of communication and troop and supply concentrations behind the battle area. This

¹⁹ War Department Field Manual (FM) 100-20, *Command and Employment of Air Power*, 21 July 1943, 1-2.

²⁰ FM 100-20, *Command and Employment of Air Power*, 3.

²¹ FM 100-20, *Command and Employment of Air Power*, 9.

restricted supply and reinforcement efforts for the enemy's front line troops. Finally, the third priority included participation in combined air and ground operations to destroy objectives in the immediate battle area.²² This last mission was described as inefficient, yet sometimes necessary. FM 100-20's conceptualization depicts, in broad outline, the organization General George Kenney built and worked within during his time in the Southwest Pacific Theater. Kenney's B-25s operated as part of the Southwest Pacific Theater's tactical air force.

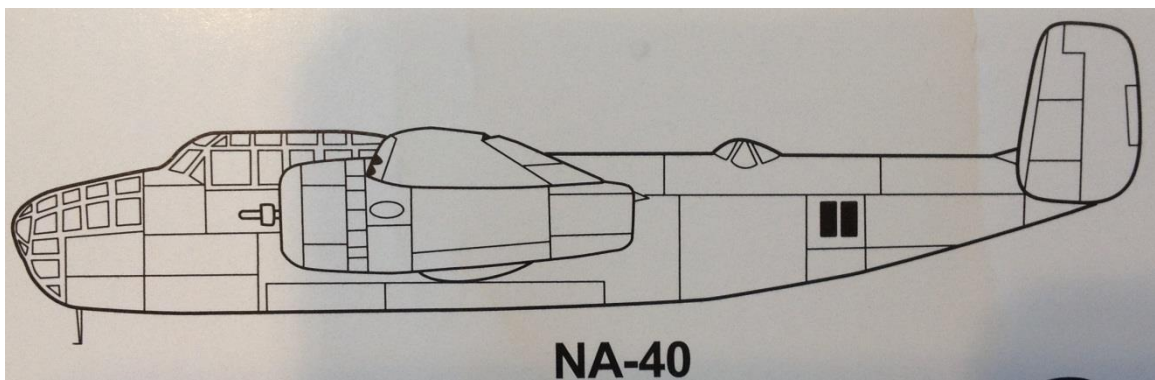


Figure 2: NA-40 Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

The North American B-25 Mitchell traces its origins to a company-financed project for a twin-engine, tricycle landing gear aircraft called the NA-40.²³ North American conceived this aircraft in response to lessons learned during an unsuccessful bid for an Army Air Corps twin-engine, light bomber called the XB-21. North American lost the contract and the AAC cancelled the aircraft before Douglas, the winning company, built any aircraft.²⁴ On 11 March 1939, however, the AAC again requested design submissions for a medium bomber, and North American began its

²² FM 100-20, *Command and Employment of Air Power*, 10.

²³ National Museum of the USAF, "NORTH AMERICAN B-25," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2509>.

²⁴ National Museum of the USAF, "NORTH AMERICAN XB-21," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2491>.

work with the NA-40.²⁵ One month later, North American's sole NA-40 crashed in a testing accident and was a complete loss.²⁶

North American's engineers remained optimistic about the design of the NA-40 and began work on a new prototype designated the NA-62. This aircraft was similar in many ways to the NA-40, but was larger to accommodate the required 3,000-pound bomb load. The increased size of the aircraft allowed the pilots to sit side-by-side rather than in the tandem configuration of the NA-40. Furthermore, it increased the aircraft's weight from 19,741 pounds to 28,577 pounds.²⁷ Thus, the NA-40 grew from a light bomber to the NA-62 medium bomber aircraft. This follows AAC thinking as it transitioned from a focus on attack aviation to medium bombardment. As the US looked towards the developing war in Europe, the NA-62 fit the requirements for a bomber smaller than the B-17, but larger than other light bombers such as the A-20 Havoc.

The AAC was concerned about the expanding war in Europe and began expediting procurement of new aircraft. Thus, they bypassed the experimental X-aircraft and test Y-aircraft process. The AAC redesignated the NA-62 as the B-25 Mitchell and ordered the first 184 bombers on 10 August 1939, even before the first one had flown.²⁸ The B-25 would go into immediate production.

²⁵ David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 6.

²⁶ Doyle, *B-25 Mitchell*, 3.

²⁷ Doyle, *B-25 Mitchell*, 6.

²⁸ Doyle, *B-25 Mitchell*, 6.

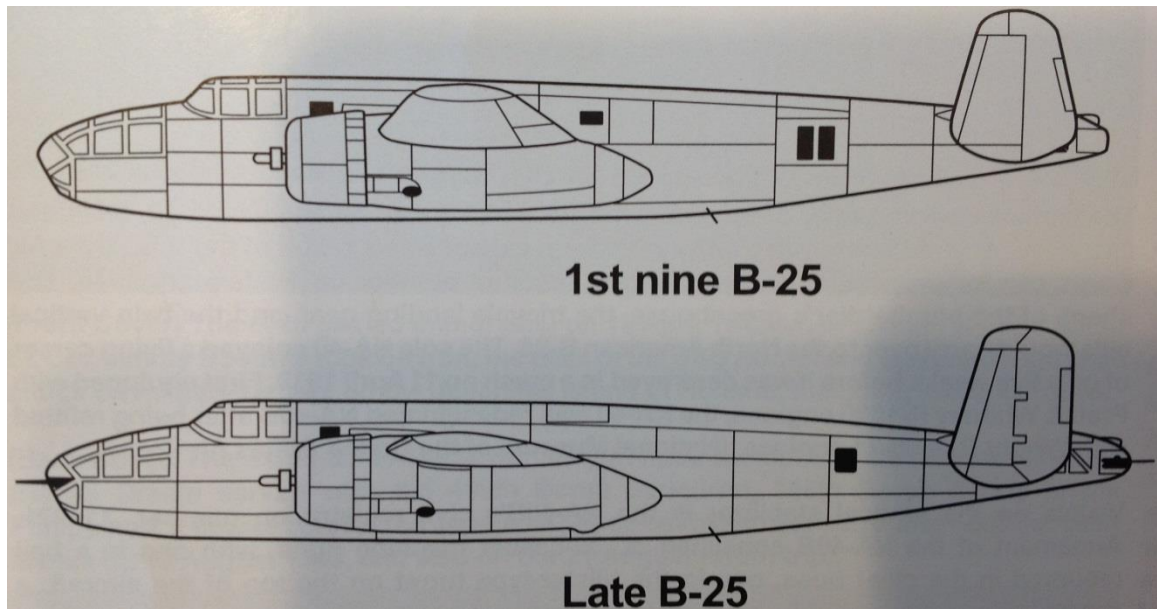


Figure 3: B-25 Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

The B-25 first flew on 19 August 1940.²⁹ Already, engineers were incorporating design changes. They altered the wing geometry after they built the first nine aircraft to improve stability. North American Aviation and the AAC watched the unfolding air war in Europe and sought to improve the defensive capability of the B-25. The B-25A emerged, externally identical to the prototype B-25, but with numerous internal improvements.³⁰ The B-25A retained the 3,000-pound bomb load. It also kept the three .30-caliber machine guns in the nose, waist, and floor along with a .50-caliber machine gun in the tail.³¹ Internally, the B-25A added armor for the aircrew and self-sealing fuel tanks. On 25 February 1941, the B-25A flew for the first time.³² The AAC based the new B-25As in Washington State, Louisiana, Maine, and Florida. The aircraft

²⁹ Doyle, *B-25 Mitchell*, 10.

³⁰ Doyle, *B-25 Mitchell*, 10.

³¹ National Museum of the USAF, "NORTH AMERICAN B-25A," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2510>.

³² Doyle, *B-25 Mitchell*, 10.

remained in the US even after the US entered WWII.³³ The AAC relegated these aircraft to coastal defense duties and by 1942 they were declared obsolete.³⁴

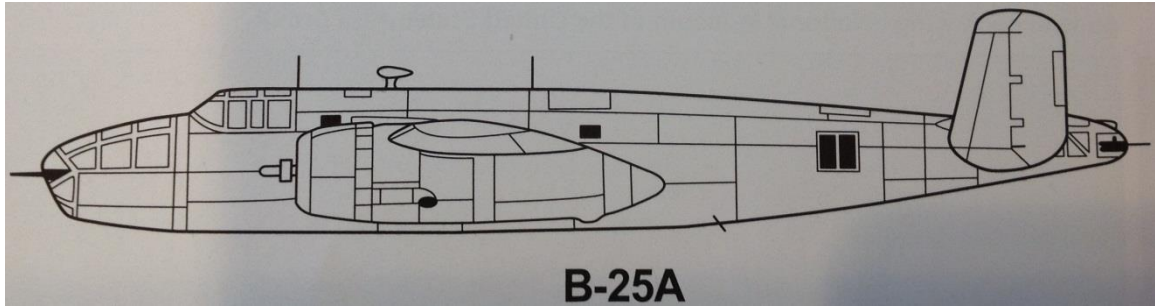


Figure 4: B-25A Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.
(Note: floor mounted cannon not visible)

The Army's primary concern with the B-25A was its ability to defend itself against enemy fighters. The current defensive armament was insufficient. North American's engineers again went to work and developed an improved B-25 model, the B-25B. This was the medium bomber with which the US entered the war in the Pacific Theater.³⁵

³³ Doyle, *B-25 Mitchell*, 10.

³⁴ National Museum of the USAF, "B-25A."

³⁵ Doyle, *B-25 Mitchell*, 16.

B-25B

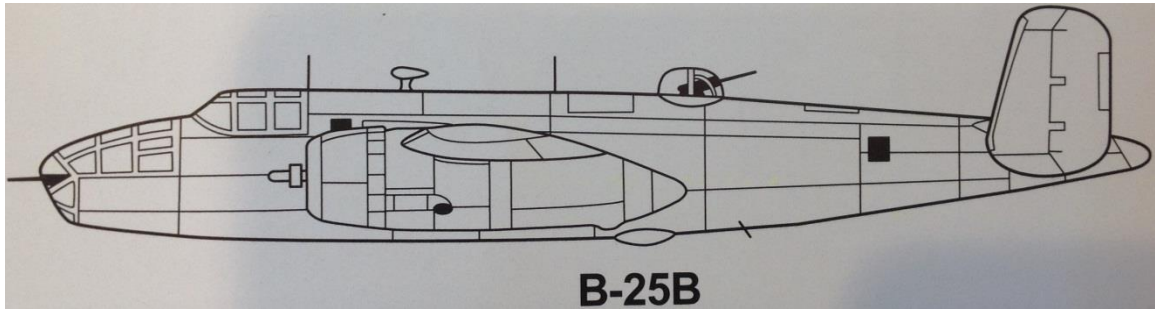


Figure 5: B-25B Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

(Note: ventral turret visible in the retracted position)

The first of 120 B-25B aircraft flew in April or May 1941.³⁶ North American Aviation addressed the AAC's concerns about defensive armament through several modifications. The B-25B retained the nose-mounted .30-caliber machine gun. They removed the floor and waist machine guns as well as the .50-caliber twin machine guns in the tail.³⁷ The engineers added two turrets. North American mounted a dorsal turret aft of the wing box and a ventral turret in the belly of the aircraft below the dorsal turret. Both turrets were power operated with twin .50-caliber machine guns. The ventral turret was retractable to decrease drag when not in use.³⁸ This turret was largely ineffective as the gunner operated the weapons by kneeling above the turret facing to the rear while looking through a periscope, making it extremely difficult to aim. This odd design often induced vertigo.³⁹ As mentioned above, the

³⁶ Doyle, *B-25 Mitchell*, 10. Note: References made to B-25 production numbers include previous versions upgraded to the newer model. Thus, the 120 B-25Bs include converted B-25A models.

³⁷ National Museum of the USAF, "NORTH AMERICAN B-25B," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2511>.

³⁸ Doyle, *B-25 Mitchell*, 16.

³⁹ Doyle, *B-25 Mitchell*, 17.

Doolittle Raiders flew modified versions of the B-25B during the famed mission to Tokyo in 1942.⁴⁰

The Doolittle Raid was the B-25's most famous mission. After the 7 December 1941 attack on Pearl Harbor, President Roosevelt was looking for an opportunity to build national morale.⁴¹ Though the Doolittle Raid used B-25s and not traditional ship-based aircraft, it was similar to other US aircraft carrier raids starting in January 1942 on Japanese bases in the Marshall Islands by two carrier task forces.⁴² Though Roosevelt played a significant role in the development and support for the mission, General Henry H. "Hap" Arnold and his staff provided the answer for Roosevelt's desire to increase public morale. Britain's Air Chief Marshal Sir Charles Portal was the first to suggest a carrier raid on Japan to Arnold, but Arnold found the idea "impractical."⁴³ A few days later, however, the idea resurfaced from two US Navy officers, Captains Francis S. Low and Donald B. Duncan.⁴⁴ The general plan required modified B-25Bs to sail on the deck of the *USS Hornet* to put them within range of Tokyo and several other Japanese cities. The aircraft needed to fly an additional 1,200 miles to China after the attack.⁴⁵

Arnold chose Lieutenant Colonel (Lt Col) James H. "Jimmy" Doolittle to lead the audacious mission. Doolittle was working on General Arnold's staff as a troubleshooter. His task at that time was to find an aircraft that could fly 2,000 miles with 2,000 pounds of bombs

⁴⁰ Doyle, *B-25 Mitchell*, 16.

⁴¹ Michael S. Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven, CT: Yale University Press, 1987), 122-123.

⁴² Ronald H. Spector, *Eagle Against the Sun: The American War with Japan* (New York: Vintage Books, 1985), 149.

⁴³ Spector, *Eagle Against the Sun*, 154.

⁴⁴ Spector, *Eagle Against the Sun*, 154; Herman S. Wolk, *Cataclysm: General Hap Arnold and the Defeat of Japan* (Denton, TX: University of North Texas Press, 2010), 51.

⁴⁵ Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 1, *Plans & Early Operations, January 1939 to August 1942* (1948; new imprint, Washington, DC: Office of Air Force History, 1983), 438; Spector, *Eagle Against the Sun*, 154.

and take off in a short distance. When Doolittle learned of the Tokyo raid, he asked Arnold if he could lead the raid since he knew more about the mission, the aircraft, and the crews than anyone else did. According to Doolittle, Arnold told him no, saying Doolittle was too valuable in his current position. After seeing Doolittle's disappointment, Arnold said, "Well, I'll tell you what, if it's all right with Miff [Miff Harmon, Arnold's chief of staff] it's all right with me."⁴⁶ Like a child negotiating between his parents, Doolittle ran to Harmon and said, "If you have no objections, Gen. Arnold has no objections to me leading the operation."⁴⁷ This, of course, led Harmon to believe he would have to disagree with Arnold in order to keep Doolittle, which was not Arnold's intent. Harmon agreed and Doolittle ran out the door before Arnold could track him down.

Now in charge of the operation, Doolittle solicited 24 volunteer crews from four squadrons, and they began their training.⁴⁸ The crews met at Eglin Field, Florida where US Navy Lieutenant Henry F. Miller taught the basic techniques of short field take-offs. All pilots concluded their training after achieving at least two takeoffs in a distance of 700-750 feet with a 31,000-pound aircraft.

The aircrew's special training was not enough to enable the B-25B to take off from an aircraft carrier deck at sea and make the required 2,400-mile journey with 2,000 pounds of bombs.⁴⁹ The baseline B-25B could carry 3,000 pounds of bombs, but only had a range of 1,350 miles.⁵⁰ Technicians at the Eglin Air Depot worked to adapt the current B-25B to meet the needs of the mission. They removed the lower turret and replaced the tail-mounted machine guns with wooden "barrels" to save weight, increase space inside the aircraft, and give the appearance of rear-facing machine guns. Then, they filled all the available space

⁴⁶ James H. Doolittle, Oral History Interview. USAF Historical Research Agency. Call: K239-0512-793, 40.

⁴⁷ Doolittle, Oral History Interview, 41.

⁴⁸ Craven and Cate, *Army Air Forces in World War II*, vol. 1, 439.

⁴⁹ Craven and Cate, *Army Air Forces in World War II*, vol. 1, 439.

⁵⁰ Doyle, *B-25 Mitchell*, 10.

within the aircraft with a 160-gallon rubber fuel bag and ten five-gallon fuel containers.⁵¹ Sixteen of the modified B-25Bs flew off the flight deck of the *USS Hornet* on the morning of 18 April 1942.

Doolittle and all 16 B-25s departed the *USS Hornet* approximately 150 miles further from Tokyo than planned.⁵² Admiral Isoroku Yamamoto, chief of the Japanese Combined Fleet, had placed picket boats six to seven hundred miles east of Japan to watch for American carriers. The raiders departed early after Admiral Halsey detected three separate picket boats.⁵³ All sixteen aircraft bombed their primary or secondary targets, but the early departure and extra distance created problems for their landings in China. The US lost all sixteen bombers, though none of the losses was a result of Japanese defenses.⁵⁴ Seven crewmembers perished in their landing attempts or were executed by the Japanese. The remaining 73 crewmembers lived to return to the US, though some not until after the war.⁵⁵ One aircraft landed in Vladivostok, Russia. The Russians retained the crew and presumably added the aircraft to the two B-25Bs they received directly from the US.⁵⁶

History views the mission as a success despite the loss of the aircraft and seven crewmembers. Arnold reported that Roosevelt was “overjoyed by the news,” knowing “the heartening effect it would have on American morale and the morale of our Allies, and the blow to the prestige of the Japanese, to have American bombers over Tokyo even for a short, fleeting time.”⁵⁷ Equally important was the effect the raid had on Japanese military planning. Evidence suggests Japanese leaders

⁵¹ Craven and Cate, *Army Air Forces in World War II*, vol. 1, 439.

⁵² Craven and Cate, *Army Air Forces in World War II*, vol. 1, 441; Spector, *Eagle Against the Sun*, 155.

⁵³ Spector, *Eagle Against the Sun*, 154.

⁵⁴ Craven and Cate, *Army Air Forces in World War II*, vol. 1, 442; Spector, *Eagle Against the Sun*, 155.

⁵⁵ Craven and Cate, *Army Air Forces in World War II*, vol. 1, 442; Spector, *Eagle Against the Sun*, 155.

⁵⁶ Doyle, *B-25 Mitchell*, 16.

⁵⁷ Wolk, 52.

were discussing the wisdom of expanding their defensive perimeter in the Pacific Theater. If that is true, it may be the reason the Japanese withdrew some fighter units for home defense and sought to extend their forces to Midway, New Caledonia, and the Aleutians.⁵⁸ Furthermore, the low-level ingress, followed by a pop-up maneuver to the desired bombing altitude differed from the Air Corps Tactical School's high altitude precision bombing tactics. The low-level tactics did two things for the Raiders. First, it limited Japanese warning time because visual observers could not detect the aircraft until they were nearly overhead. Second, Japanese air defenses had a very short window of opportunity to engage the B-25s as they passed overhead. In fact, the Doolittle Raider's tactics foreshadowed the flight profiles used by later B-25 models in the Pacific Theater.⁵⁹

Aircraft modifications made for the Doolittle Raid indicate the B-25B was not suited perfectly for long-range missions over the Pacific Ocean. Long-range missions required additional fuel tanks, and the low-level flight necessitated changes to aircraft armament. Doolittle's actions served as a model for future ad hoc aircraft modifications to make the B-25 suitable for combat in the Pacific. Units in the Southwest Pacific Theater followed Doolittle's example when they added extended range fuel tanks and armament appropriate to the missions they flew in the months following the Doolittle Raid.

⁵⁸ Craven and Cate, *Army Air Forces in World War II*, vol. 1, 444; Sherry, *Rise of American Air Power*, 123.

⁵⁹ Wolk, 52.

B-25C&D

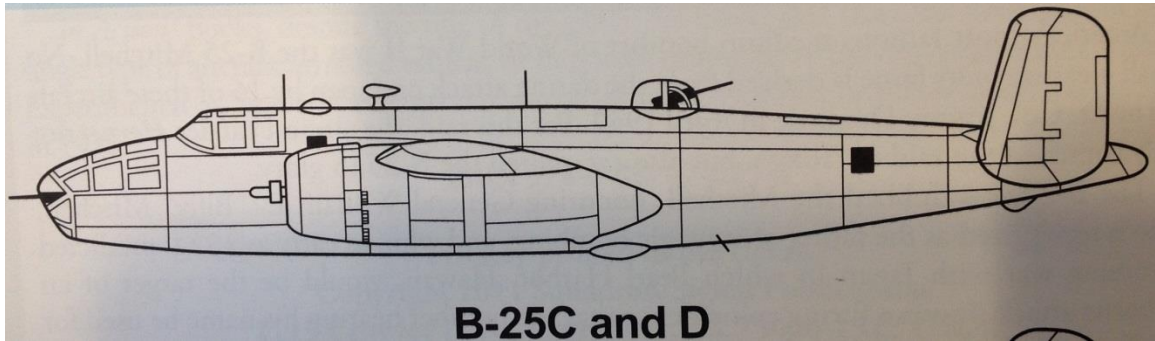


Figure 6: B-25C/D Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

(Note: ventral turret visible in the retracted position and fixed .50-caliber machine gun not visible, but located on the right side of the nose of the aircraft)

The first B-25C took flight on 9 November 1941, only six or seven months after the first flight of the B-25B. There were only 184 earlier model B-25s built. The B-25C was the first mass production B-25, with 1,625 rolling off the Inglewood, California assembly lines.⁶⁰ Like previous models, there were several changes to this new model.

North American modified the machine gun systems again, giving the B-25C more firepower than previous models. This change is likely a result of the Royal Air Force's experience early in the war. Daylight bombing attracted enemy pursuit aircraft and bombers required heavier machine guns to repel the attacks.⁶¹ They replaced .30-caliber flexible machine gun in the nose with a .50-caliber machine gun. They also mounted a second, fixed .50-caliber machine gun in the nose, which was pilot-controllable. Though limited to a single weapon, the pilot-controlled machine gun is the first indication of a strafing role for the B-25. The aircraft gained improved Bendix turrets in the dorsal and ventral

⁶⁰ Doyle, *B-25 Mitchell*, 23.

⁶¹ Biddle, *Rhetoric and Reality*, 207-212.

positions, both retaining the twin .50 caliber machine guns.⁶² The B-25C had six machine guns, the largest number on a B-25 up to that time. The upgrades, however, were not limited to defensive armament.

The addition of external bomb racks increased the B-25C's offensive firepower. North American mounted ordnance racks under each wing and the fuselage. The fuselage station could carry a 2,000-pound torpedo, increasing the aircraft's capability against maritime targets. Furthermore, the engineers improved visibility for the crew by adding blister-style windows for the navigator and redesigning the pilots' windshield.⁶³

The US exported B-25C models and used them in a variety of other roles. Great Britain, the Netherlands, China, Russia, and Canada all received B-25Cs. Several other aircraft were modified for passenger transport and other roles. Finally, North American modified three B-25C aircraft for experimental purposes, designating these aircraft the XB-25E, F, and G. The XB-25E and F models were experimental aircraft for anti- and de-icing capabilities. The XB-25G tested new ideas and technology eventually leading to the B-25G.⁶⁴

The B-25D was identical to the B-25C. The different designation indicated construction at North American Aviation's Kansas City, Missouri manufacturing plant. The B-25D first flew on 3 January 1942.⁶⁵ The one difference between the B-25D and the B-25C was that North American assembled 300 of the D models without the ventral turret due to production problems at the Bendix manufacturing plant.⁶⁶ North American Aviation built 2,290 B-25D aircraft.⁶⁷

⁶² Doyle, *B-25 Mitchell*, 23.

⁶³ Doyle, *B-25 Mitchell*, 23.

⁶⁴ National Museum of the USAF, "NORTH AMERICAN B-25C," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2512>.

⁶⁵ National Museum of the USAF, "NORTH AMERICAN B-25D," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2513>.

⁶⁶ Doyle, *B-25 Mitchell*, 23.

⁶⁷ National Museum of the USAF, "B-25D."

B-25G

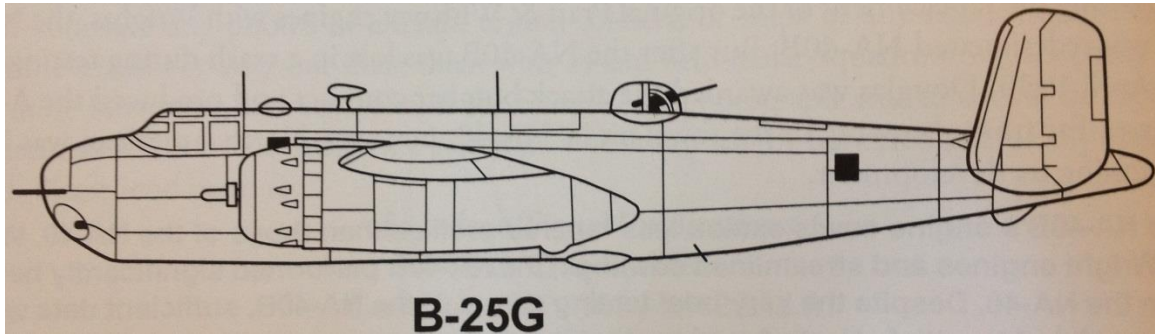


Figure 7: B-25G Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

(Note: ventral turret is visible in the retracted position, 75-mm cannon is visible in the lower part of the nose, twin .50-caliber machine guns are mounted side-by-side above the cannon, and the later version's waist gun and tail gun are not depicted)

The XB-25G was a modified B-25C. The manufacturer tested the XB-25G extensively after its first flight in October 1942.⁶⁸ They developed the B-25G to meet air strategists' requirements for a lethal ground attack and strafing platform.⁶⁹ North American removed the greenhouse nose of earlier B-25 models and replaced it with a solid, shorter nose. Within the nose, they housed pilot-controlled side-by-side .50-caliber machine guns. Below and to the left of these machine guns they mounted the largest forward-firing cannon ever used in a US bomber (though the AC-130 gunship has a larger side-mounted cannon).⁷⁰ This was a 75mm M-4 cannon, basically a tank gun with an 18-pound projectile. Approximately the first half of the B-25G production run retained the ventral turret before it was discontinued. In its place, modification centers added a single .50-caliber machine gun in

⁶⁸ Doyle, *B-25 Mitchell*, 49.

⁶⁹ Doyle, *B-25 Mitchell*, 54; National Museum of the USAF, "NORTH AMERICAN B-25G," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2514>.

⁷⁰ National Museum of the USAF, "NORTH AMERICAN XB-25G," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2570>.

the tail and occasionally waist gun positions as well.⁷¹ Therefore, factory-built aircraft had only two defensive machine guns in the dorsal turret. The fixed twin machine guns and the cannon in the nose were for offensive use when strafing ground targets. The field modifications could add up to three additional defensive .50-caliber machine guns.

Other changes reflected the increased focus on strafing and ground attack. North American added increased armor for the crew and ammunition storage areas. The fuel capacity was increased to support longer-range flights or increased loiter time. Despite the increased weaponry and additional weight, the aircraft's speed was reduced only by 3 miles per hour.⁷²

The B-25G contract modified the B-25C contract, requiring the last 400 B-25C aircraft to be completed in a B-25G configuration. Additionally, 63 other B-25C aircraft were converted to B-25G standards.⁷³ The combination of two fixed, forward-firing .50-caliber machine guns and the 75mm cannon represent a further commitment by the Army Air Forces⁷⁴ (AAF) to adapt the B-25 to a ground attack strafing and bombing role. The next model, the B-25H, expanded the aircraft's ground attack capability.

⁷¹ Doyle, *B-25 Mitchell*, 49.

⁷² National Museum of the USAF, "B-25G."

⁷³ Doyle, *B-25 Mitchell*, 49.

⁷⁴ The US Army Air Corps became the US Army Air Forces on 20 June 1941.

B-25H

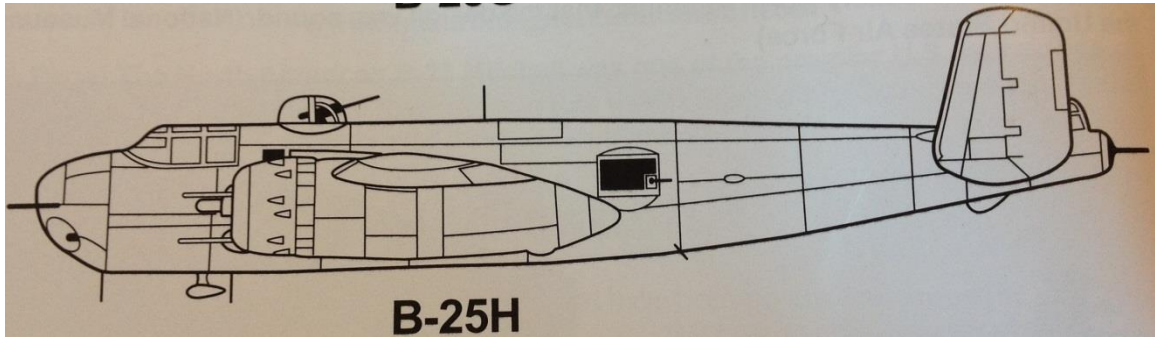


Figure 8: B-25H Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

(Note: 75-mm cannon is visible in the lower part of the nose, four .50-caliber machine guns are mounted side-by-side above the cannon, and the barrels of two fuselage mounted .50-caliber machine guns are visible just forward of the engine nacelle)

The first B-25H was a modified B-25C.⁷⁵ The prototype first flew in May 1943. The modification represented an improved version of the B-25G. The first of 1,000 production model B-25Hs flew on 31 July 1943.⁷⁶ While the B-25G met the increased ground attack needs of the AAF, its factory-installed self-defense capabilities remained weak. North American made several modifications and accepted others previously performed at modification centers. They moved the dorsal turret forward and permanently removed the ventral turret. The engineers added .50-caliber machine guns in waist positions to compensate for the removal of the ventral turret. Additionally, the tail gun became a permanent fixture and included twin .50-caliber machine guns.⁷⁷ The B-25H, therefore, included six defensive .50-caliber machine guns. The offensive capability, however, increased as well.

⁷⁵ Doyle, *B-25 Mitchell*, 54.

⁷⁶ National Museum of the USAF, "NORTH AMERICAN B-25H," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2515>.

⁷⁷ National Museum of the USAF, "B-25H."

The B-25H doubled the G model's nose-mounted firepower with four .50-caliber machine guns mounted line abreast. Then engineers mounted two additional .50-caliber machine guns on each side of the aircraft below and aft of the pilots in fuselage-mounted pods. The B-25H replaced the B-25G's original 75mm cannon with an improved lighter model.⁷⁸

The B-25H was a formidable weapon. In addition to the 75mm cannon, it directed 10 .50-caliber machine guns (including the dorsal turret) against ground targets. Additionally, six machine guns were available for defensive use. Notably, the crew complement changed on the B-25H. A new navigator's position replaced the copilot's position and controls. Beyond his navigation role, the navigator performed the bombardier, radio operator, and cannon-loader duties.⁷⁹ Though the B-25H was a highly capable aircraft, the evolution of the B-25 was not complete. North American adapted the B-25 again and created the final version of the Mitchell, the B-25J.

⁷⁸ Doyle, *B-25 Mitchell*, 54.

⁷⁹ National Museum of the USAF, "B-25H."

B-25J

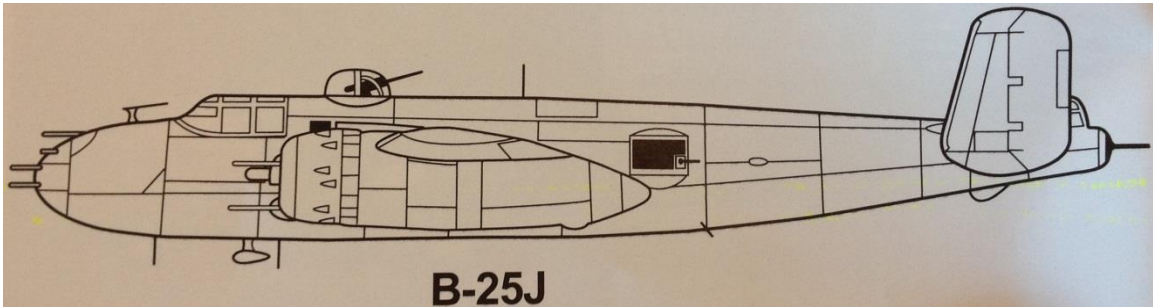


Figure 9: B-25J Diagram

Source: David Doyle, *B-25 Mitchell: In Action* (Carrollton, TX: Squadron/Signal Productions, 2011), 4.

(Note: solid nose version is depicted with eight .50-caliber machine guns mounted in pairs inside the nose and the barrels of two of the four fuselage mounted .50-caliber machine guns are visible just forward of the engine nacelle)

North American Aviation built 4,318 B-25Js, far more than any other model. It was basically an improved B-25H, but regained some characteristics of the B-25C aircraft. The B-25J had two different nose configurations. Initially, the greenhouse style nose from the B-25C returned. They fitted it with one fixed and one flexible .50-caliber machine gun. The other machine guns remained unchanged from the B-25H with the exception of an upgraded mount for the tail turret. The B-25J did not have a 75mm cannon, but the strafing role remained an important mission for the B-25. North American provided a different version B-25J for this role.

North American modified 800 B-25J aircraft with a solid nose. This nose housed eight .50-caliber machine guns bringing the total strafing firepower to a powerful 14 .50-caliber weapons.⁸⁰ North

⁸⁰ National Museum of the USAF, "NORTH AMERICAN B-25J," <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=2516>.

American produced 1,000 conversion kits allowing modification of other B-25J aircraft to the solid nose-eight gun model.⁸¹

Again, the crew complement changed. The model with the greenhouse nose included a position for a bombardier and both models restored the copilot's position and a full set of controls.⁸² The first B-25J flew on 14 December 1943 and North American ceased production in August 1945.⁸³

This chapter described North American Aviation's production of the varied B-25 models. Some aircraft modifications resulted from feedback and modifications made by units employing the aircraft. The next chapters examine the two individuals typically credited with the leadership, technical know-how, and innovative thinking which led to continual adaptation of B-25 and other aircraft in the Pacific Theater of WWII.

North American Aviation Corporation's B-25 upgrades represent the evolution of the aircraft throughout the war. The modifications were not based solely on the manufacturer's design improvements or new aircraft design requests from the Army Air Forces. General George Kenney provided top-down innovation and leadership while coordinating with General Henry "Hap" Arnold, Chief of the Army Air Forces. This, in turn, created opportunities to modify the B-25. The engineering know-how came from the bottom-up, innovative solutions of Captain (and eventually Colonel) Paul I. "Pappy" Gunn and others at unit level. The following sections describe the contributions of these two innovators and how their efforts changed the B-25 from a high-altitude bomber to a low-altitude strafing and commerce destroyer.

⁸¹ Dolye, *B-25 Mitchell*, 64.

⁸² Doyle, *B-25 Mitchell*, 64.

⁸³ National Museum of the USAF, "B-25J."

Chapter 2

Top-Down Innovation—The Work of General Kenney



Figure 10: General George C. Kenney

Source: American Airpower Biography, “George C. Kenney,”
<http://www.airpower.maxwell.af.mil/airchronicles/cc/biograph.html>
(accessed 14 April 2013).

Of all the commanders of our major Air Forces engaged in World War II, none surpassed General Kenney in those three great essentials of successful combat leadership: aggressive vision, mastery over air strategy and tactics, and the ability to exact the maximum in fighting qualities from both men and equipment.

General Douglas MacArthur

The evolution of the B-25 is, in part, a product of top-down innovation by General George C. Kenney. The story that unfolds reveals General Kenney’s perspectives and the credit he received for wartime innovations and leadership. Some of the credit is, undoubtedly, a result of over-reliance on his engaging writings and oral interviews, which are

extensively cited in other works. In the following chapter, one finds a different perspective focusing on innovation that took place in a “bottom-up” fashion from the unit level. The final chapter analyzes the different sources of innovation to identify the root(s) of innovative genius leading to B-25 modifications in the Southwest Pacific Theater.

George Churchill Kenney was born on 6 August 1889 in Yarmouth, Nova Scotia. His parents relocated to Brookline, Massachusetts around 1900 when Kenney was 11 years old. Though never considered a gifted student or athlete, the Massachusetts Institute of Technology (MIT) accepted Kenney to study civil engineering.¹ While studying at MIT and shortly afterward, several important events shaped Kenney’s future. In 1910, Kenney attended a flying competition sponsored by Harvard University and the city of Boston. He offered his assistance to one of the aircrew members, and the pilot rewarded him with a short flight. “From then on, [Kenney] recounted, I knew that was what I was going to do.”² The second event was not aviation related, but had a direct impact on Kenney’s life as an Airman.

Kenney left MIT in 1911, shortly before graduating. Boredom and family troubles drew him away from his academics.³ He worked jobs with the railroad and an engineering firm before starting his own general contracting firm with a friend. Kenney found he enjoyed engineering and design work, but was more interested in solving problems arising after a project started.⁴ The Army Air Service put his desire to solve problems to great use in the next stage of Kenney’s career.

¹ Thomas E. Griffith, *MacArthur’s Airman: General George C. Kenney and the War in the Southwest Pacific* (Lawrence, KS: University Press of Kansas, 1998), 3; Stephens, “George C. Kenney,” 70; Herman S. Wolk, “The Other Founding Father,” *Air Force Magazine*, September 1987, 164.

² Griffith, *MacArthur’s Airman*, 4-5; James C. Hasdorff, General George C. Kenney Oral History Interview, USAF Historical Research Agency, Call: K239-0512-806; Stephens, “George C. Kenney,” 70.

³ Griffith, *MacArthur’s Airman*, 5; Stephens, “George C. Kenney,” 70.

⁴ Griffith, *MacArthur’s Airman*, 6; Hasdorff, Kenney Oral History Interview, 5-6; Stephens, “George C. Kenney,” 70.

President Woodrow Wilson's decision to involve the United States in World War I was a pivotal moment for George Kenney. The 2 April 1917 presidential request to Congress provided Kenney an opportunity to switch from civil engineering to a career in aviation sparked by his first flight seven years earlier.⁵ Kenney entered the US Army's Air Service, finishing flight school in September 1917 and flying his first combat engagement as an observation pilot in August 1918. He achieved his first and second air-to-air kills in September and October 1918.⁶ His flying experience in World War I provided Kenney with several lessons he carried forward into the next portion of his career.

His personal experience with a lack of training before engaging in combat led him to believe that training was the key to survival in combat. With a life expectancy of about one month, the battlefields over World War I Europe were extremely hazardous for new pilots. Three-quarters of the original pilots in his World War I squadron did not make it through the war, a fact that Kenney blamed on a lack of realistic training. Many of Kenney's contemporaries felt the same way.⁷ Another lesson was that "the impact of being jumped by fifty German planes" left Kenney with an appreciation of the importance of air superiority. In a letter to General Hap Arnold, Kenney later suggested the importance of one principle; "Get control of the air before you try anything else."⁸ Lastly, Kenney recognized the importance of leadership and morale. He saw the difference between the way aircrews lived during the war and the more rugged conditions of the maintainers and support troops. Moreover, he

⁵ Griffith, *MacArthur's Airman*, 7; Hasdorff, Kenney Oral History Interview, 10; Stephens, "George C. Kenney," 70.

⁶ George W. Goddard, General George C. Kenney Oral History Interview, USAF Historical Research Agency, K239.0512-1011, 1; Griffith, *MacArthur's Airman*, 9, 11-12; Hasdorff, Kenney Oral History Interview, 23; Marvin M. Stanley, General George C. Kenney Oral History Interview, USAF Historical Research Agency, Call: K239.0512-747, 5; Stephens, "George C. Kenney," 71; Wolk, "Other Founding Father," 165.

⁷ Goddard, Kenney Oral History Interview, 6-7; Griffith, *MacArthur's Airman*, 15; Hasdorff, Kenney Oral History Interview, 19; Stanley, Kenney Oral History Interview, 5; Stephens, "George C. Kenney," 71.

⁸ Griffith, *MacArthur's Airman*, 16; Stephens, "George C. Kenney," 71.

felt commendations and medals improved morale by recognizing the efforts of all Airmen, regardless of rank or job.⁹ Through the interwar years and during World War II, Kenney's three lessons provided the foundation for many of his decisions.

The interwar years built upon Kenney's World War I lessons. His interwar assignments were of three types. Initially, he focused on the technical aspects of aviation to include the research and development of new aircraft, bombs, engines, and machine guns. He was also a student and an instructor at several Army professional military education institutions. Finally, he worked as a staff officer where he learned how to organize and lead large air forces.¹⁰

In 1920, Kenney attended the Air Service Engineering School. He thought the curriculum was very challenging and picked up where his MIT education ended. He left the school in 1921 and put his education to work. Kenney went on to serve as an aircraft acceptance pilot, test flying new aircraft before they were distributed to Army Air Service units. He also worked in aircraft design and modification while at the Air Service Engineering Division. One of his ideas during this time was to move a fighter's machine guns from behind the propeller to the wings. The Army Air Corps did not implement this modification until World War II generation aircraft arrived.¹¹ After Kenney's foray into the technical aspects of aviation, he returned to education.

In 1925, Kenney became a student at the Air Service Tactical School (later to become the Air Corps Tactical School). This school

⁹ George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan, and Pearce, 1949), 43; George C. Kenney, *The MacArthur I Know* (New York: Duell, Sloan, and Pearce, 1951), 51; Griffith, *MacArthur's Airman*, 16; Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York: Random House, 1993), 417; Stephens, "George C. Kenney," 71.

¹⁰ Griffith, *MacArthur's Airman*, 17; Bulletin No. 5, Headquarters General Headquarters Air Force, 2 November 1935, USAF Historical Research Agency, Call: 415.171; Wolk, "Other Founding Father," 165.

¹¹ Goddard, Kenney Oral History Interview, 8; Griffith, *MacArthur's Airman*, 20-21; Hasdorff, Kenney Oral History Interview, 30-31; Stephens, "George C. Kenney," 72-73; Wolk, "Other Founding Father," 165.

focused on the tactical application of air forces. Following his graduation, he moved on to the Army's Command and General Staff School where he learned how to integrate infantry, artillery, and cavalry into a combined fighting force. This course was very ground-centric and commonly criticized by Airmen for its lack of focus on the integration of airpower with ground forces.¹² Following the Command and General Staff College, Kenney returned to the Air Corps Tactical School (ACTS) as an instructor.

Kenney returned to the ACTS at a time when the institution was beginning to change its views on airpower.¹³ The Army Air Corps focused increasingly on strategic bombing and the concept of affecting the enemy's will to fight rather than simply attacking his forces.¹⁴ This theory led to an increased emphasis on strategic bombing. Efforts in the late 1920s led Billy Mitchell followers like Lt. Kenneth Walker to decree, "A well-organized, well-planned, and well flown air force attack will constitute an offensive that cannot be stopped."¹⁵ Kenney, however, did not subscribe to this line of thinking. The idea that a bomber force was invincible ran directly counter to his World War I lessons about air superiority. Instead, Kenney focused his thinking on attack aviation, which the British described as attacks on ground troops or the areas directly to the rear of front line troops.¹⁶ "Kenney was helping pioneer the use of aviation in what would later be labeled interdiction."¹⁷ He

¹² Goddard, Kenney Oral History Interview, 8; Griffith, *MacArthur's Airman*, 21-23; Stanley, Kenney Oral History Interview, 6; Stephens, "George C. Kenney," 73.

¹³ Goddard, Kenney Oral History Interview, 8; Stephens, "George C. Kenney," 74.

¹⁴ Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas about Strategic Bombing* (Princeton, NJ: Princeton University Press, 2002), 139.

¹⁵ Biddle, *Rhetoric and Reality in Air Warfare*, 142.

¹⁶ Griffith, *MacArthur's Airman*, 25; Richard Hallion, *Strike from the Sky: The History of Battlefield Air Attack* (Washington DC: Smithsonian Institution Press, 1989), 20; Lee B. Kennett, *The First Air War 1914-1918* (New York: Simon & Schuster, 1999), 211, 221-222; Stanley, General George C. Kenney Oral History Interview, 6; Stephens, "George C. Kenney," 73.

¹⁷ Griffith, *MacArthur's Airman*, 26; Stanley, General George C. Kenney Oral History Interview, 6-7.

even authored textbooks on the topic. Kenney's focus on attack recalled his earlier work with the technical aspects of aircraft research and development.

The AAC recalled lessons about low-level attack aviation from World War I. Aircraft were vulnerable to enemy ground fire. This fact was part of the drive to move aircraft to higher altitudes and build them into self-defending fortresses. Therefore, the AAC focused on light and medium bombers rather than attack aircraft.¹⁸ Kenney could not counter this argument at the time, but he did focus his thoughts and lesson plans on other low-altitude bombing challenges while he was an ACTS instructor.¹⁹ Aircraft flying at low altitudes were vulnerable to the blast of their own bombs. Kenney developed a parachute for the bombs in 1928. This parachute slowed the bomb's descent allowing the aircraft to travel out of the bomb's blast radius.²⁰ Kenney made his mark at the ACTS and "his exceptional qualities were recognized . . . most notably by Generals Mitchell, Benjamin Foulois, Frank Andrews, and Henry 'Hap' Arnold."²¹ Some, however, disliked his outspoken nature. He moved on to another educational opportunity in 1932.

Kenney moved from the ACTS to the Army War College in 1932. He discovered an under representation of Airmen as well as a lack of air-focused curricula, similar to the environment he found at the Command and General Staff College. He focused his course paper on the AAC and concluded it needed to grow in size to meet the demands of the air

¹⁸ Griffith, *MacArthur's Airman*, 27; Hallion, *Strike from the Sky*, 48-49; Lee Kennett, "Developments to 1939," in *Case Studies in the Development of Close Air Support*, ed. Benjamin Franklin Cooling (Washington DC: Office of Air Force History, US Air Force, 1990), 51-52.

¹⁹ George C. Kenney, "Attack Aviation: 1927-1928" (Air Corps Tactical School Conference Lesson Plan), USAF Historical Research Agency, Call: 248.2201B-1; Wolk, "Other Founding Father," 165.

²⁰ Griffith, *MacArthur's Airman*, 28; Hasdorff, General George C. Kenney Oral History Interview, 71; Matthew K. Rodman, *A War of Their Own: Bombers over the Southwest Pacific* (Maxwell AFB, AL: Air University Press, 2006), 10; Stanley, General George C. Kenney Oral History Interview, 9.

²¹ Stephens, "George C. Kenney," 72.

mission. The completion of this course marked the end of Kenney's professional military education.²² Though the focus on airpower was limited (except, of course, at ACTS), Kenney gained several advantages from his attendance at the schools. Kenney met and worked closely with many ground commanders he would later see in the Pacific Theater of World War II. Furthermore, he gained an understanding of how ground officers would fight a war and the common language they would use.²³ The time for war had not yet arrived and Kenney left the War College to be a staff officer in the Office of the Chief of the Air Corps.

Then Lieutenant Colonel Kenney (a temporary rank; his permanent rank was captain) worked on one of the most important issues of the interwar years; the fight for an independent air force. In this effort, he gained insight into how air forces should be organized and trained to meet mission requirements.²⁴ In 1933, Major General Benjamin Foulois asked Kenney and Hap Arnold to translate from Italian and build a summary of Giulio Douhet's air theories. Kenney was establishing himself as one of the AAC's "foremost air power thinkers."²⁵

After working on these projects, and getting some unpleasant visibility with high-ranking Army officers like General Douglas MacArthur, Kenney became the Assistant Chief of Staff for operations and training. This assignment was right in line with one of Kenney's lessons from World War I. He focused on the combat training of various units, visiting them at their home bases and organizing realistic training exercises. In his mind, these efforts displayed the importance of leadership and morale while building a force ready for war.²⁶ He would soon get an opportunity to command an operational unit.

²² Griffith, *MacArthur's Airman*, 31; Stephens, "George C. Kenney," 74.

²³ Griffith, *MacArthur's Airman*, 43.

²⁴ Griffith, *MacArthur's Airman*, 33; Stephens, "George C. Kenney," 73.

²⁵ Hugh N. Ahmann, Maj Gen Eugene L. Eubank Oral History Interview, USAF Historical Research Agency, K239.0512-1345, 78; Stephens, "George C. Kenney," 74.

²⁶ Griffith, *MacArthur's Airman*, 35.

In the summer of 1938, having returned to his permanent rank of Captain, Kenney took command of the 89th Observation Squadron.²⁷ This command, however, was short lived as General Arnold pulled Kenney back to Washington to help with the pre-war buildup of air forces in 1939. Arnold began moving Kenney through a variety of jobs to help Kenney “expand his understanding of military affairs, especially the political dimension.”²⁸ Arnold sought to use Kenney’s earlier experience in aircraft production. Kenney tracked manufacturers’ production goals and ensured units received the correct aircraft on time.²⁹ In 1940, Kenney was promoted to Lieutenant Colonel (again) and became the second-in-command of the Materiel Division of the AAC. The design and construction of new aircraft fell under his direct supervision. During this time, Arnold sent Kenney to Great Britain as an observer with the Royal Air Force. While there, he observed the Battle of Britain and discovered that the AAC lagged behind the Germans in several areas.³⁰ This experience further developed Kenney as a well-rounded Airman by expanding his knowledge of aircraft engineering, acquisitions, and employment in the early stages of WWII.

While retaining his responsibilities at the Materiel Division, he became the commander of the Air Corps Experimental Depot and Engineering School in January 1941 and was promoted to brigadier general, bypassing colonel altogether. Brigadier General Kenney remained in these positions until March 1942 when he received his second operational command. Kenney moved to San Francisco, was promoted to major general, and took command of the Fourth Air Force. While holding responsibility for the defense of the west coast, he focused on training for the bomber and fighter crews, achieving a dramatic decline in mishaps. This feat is impressive because he achieved it through changes in

²⁷ Griffith, *MacArthur’s Airman*, 39.

²⁸ Stephens, “George C. Kenney,” 75.

²⁹ Griffith, *MacArthur’s Airman*, 41; Wolk, “Other Founding Father,” 165.

³⁰ Stephens, “George C. Kenney,” 75.

training during a short four months of command. Arnold recalled Kenney to Washington yet again. This time he would not be a staff officer or leading a project—he was going to war.³¹

Kenney's career took a turn on 12 July 1942, when General Arnold notified him of his new position as General MacArthur's Allied Air Force Commander in the Southwest Pacific Theater.³² During this visit, he gained an understanding of the "Europe First" strategy and its implications on the Pacific Theater. The US would focus its efforts in Europe and attempt to hold off the Japanese in the Pacific. The US leadership did not think the resources were available to fight offensively in both theaters at once.³³ Kenney became concerned about the way people viewed the Pacific theater and the general acceptance that the Japanese would likely soon land in Australia and begin offensive operations on that continent. Overall, the Pacific strategy was to be a sort of "strategic defensive" where the Allies hoped to preserve the opportunity to fight the Japanese after the Germans were defeated in Europe.³⁴

Despite the less than favorable outlook for his new command, Kenney began making innovative decisions and thinking proactively before he even left Washington DC. Knowing his predecessor requested more resources loudly and often, Kenney tried to get "anything that was

³¹ Eric M. Bergerud, *Fire in the Sky: The Air War in the South Pacific* (New York: Basic Books, 2009), 289; Griffith, *MacArthur's Airman*, 42; Goddard, Kenney Oral History Interview, 8; Hasdorff, Kenney Oral History Interview, 46-47; Stephens, "George C. Kenney," 76; Wolk, "Other Founding Father," 165.

³² Dorris Clayton James, "Oral Reminiscences of General George C. Kenney," Interview, 16 July 1971, USAF Historical Research Agency, Call 168.7103-24, 2; George C. Kenney, Papers, 12 July 1942, USAF Historical Research Agency, Micfilm 27131, Frame 0049; Stephens, "George C. Kenney," 76; Wolk, "Other Founding Father," 165.

³³ George C. Kenney, *General Kenney Reports: A Personal History of the Pacific War* (New York: Duell, Sloan, and Pearce, 1949), 10; Matthew K. Rodman, *A War of Their Own: Bombers Over the Southwest Pacific* (Maxwell AFB, AL: Air University Press, 2006), 22; Stephens, "George C. Kenney," 89; Wolk, "Other Founding Father," 166.

³⁴ Kenney, *General Kenney Reports*, 11.

not nailed down” assigned to him in the Southwest Pacific Theater.³⁵ General Arnold was not impressed with the P-38, so Kenney easily acquired 50 P-38s and pilots from the Fourth Air Force. Furthermore, he discovered 3,000 parachute-fragmentation bombs being held in war reserve. No other units were asking for or using these bombs, so Kenney had them shipped to Australia.³⁶ In fact, Kenney is the reason these bombs existed at all. They were the same ones Kenney designed in 1928. Despite effective testing, the Air Corps largely forgot about the 3,000 bombs and put them into storage. Kenney took advantage of this luck 14 years later.³⁷ The parachute-fragmentation bombs and P-38s would rendezvous with Kenney and his new command in Australia.

Kenney arrived in Australia on 28 July 1942.³⁸ He began making changes immediately. As described earlier, Kenney’s interwar assignments in the technical side of aviation, military education, and the political environment of Washington DC prepared him superbly for this new command.³⁹ Kenney’s predecessor, Lieutenant General George H. Brett, had a poor relationship with MacArthur and his staff. General Arnold and Army Chief of Staff General George C. Marshall outlined the tense situation in the Southwest Pacific to Kenney when describing his new assignment. Kenney would attack this problem head-on by “get[ing] rid of a lot of the Air Corps deadwood as no one could get anything done

³⁵ Kenney, *General Kenney Reports*, 12; Arthur Marmore, General O.P. Weyland Oral History Interview, USAF Historical Research Agency, K239.0512-798; Wolk, “Other Founding Father,” 166.

³⁶ Steve Birdsall, *Flying Buccaneers: The Illustrated Story of Kenney’s Fifth Air Force* (Garden City, NY: Doubleday & Company, INC., 1977), 20; Kenney, *General Kenney Reports*, 12; Stanley, General George C. Kenney Oral History Interview, 8; Wolk, “Other Founding Father,” 166.

³⁷ The Pacific War Online Encyclopedia, “Parafrag Bombs,” http://pwencycl.kgbudge.com/P/a/Parafrag_Bombs.htm; Hasdorff, General George C. Kenney Oral History Interview, 73; Kenney, *General Kenney Reports*, 12; Rodman, *A War of Their Own*, 44; Stephens, “George C. Kenney,” 73.

³⁸ Griffith, *MacArthur’s Airman*, 56.

³⁹ Griffith, *MacArthur’s Airman*, 17.

with the collection of generals that Brett had under him.”⁴⁰ When Kenney arrived in the Southwest Pacific Theater, he quickly acted on his earlier statement. Upon taking command from Brett, he sent home three general officers and about forty colonels and lieutenant colonels.⁴¹ Thomas Griffith described Kenney as being “ruthless in purging those who did not match his energy or sense of commitment.”⁴² He replaced these officers with men he called “operators.” He sought out “aggressive, energetic, and flexible individuals capable of leading, and concerned foremost with getting on with the war.”⁴³ The draconian reshaping of his staff repaired some of the problems of his predecessor, but he also needed to improve the AAF’s relationship with MacArthur.

General Kenney met with General MacArthur for the first time in Australia on 29 July 1942. Kenney knew this meeting was more about politics than military matters. He needed to gain MacArthur’s trust. The meeting began with MacArthur lecturing Kenney on the failures of the Allied Air Forces. Kenney finally interjected after listening for over an hour. Kenney’s take-charge attitude and no-nonsense manner of speaking endeared him to General MacArthur immediately. Kenney also made it clear that he would run all air operations. This simple statement re-established the command link between General MacArthur and his air commander. It also prevented MacArthur’s staff from interfering with air operations. This had been particularly challenging during Brett’s time in

⁴⁰ Ahmann, Eubank Oral History Interview, 106; James, “Oral Reminiscences,” 5; George C. Kenney, Diary, 29 July 1942, USAF Historical Research Agency, 168.7103-71; George C. Kenney, Papers, 12 July 1942, USAF Historical Research Agency, Micfilm 27131, Frame 0049; Rodman, *A War of Their Own*, 23, 26; Herman S. Wolk, “George C. Kenney,” in *We Shall Return! MacArthur’s Commanders and the Defeat of Japan*, ed. William M. Leary (Kentucky: University Press of Kentucky, 1988), 92; Wolk, “Other Founding Father,” 166.

⁴¹ Stanley, General George C. Kenney Oral History Interview, 23; Stephens, “George C. Kenney,” 85; Wolk, “George C. Kenney,” 93.

⁴² Griffith, *MacArthur’s Airman*, 60.

⁴³ Griffith, *MacArthur’s Airman*, 59; Rodman, *A War of Their Own*, 50; Stephens, “George C. Kenney,” 85; Wolk, “Other Founding Father,” 173.

command.⁴⁴ Kenney's manpower changes, however, were only part of his plan to resurrect the Allied Air Forces in the Southwest Pacific Theater.

On 7 August 1942, General Kenney requested permission to create the Fifth Air Force out of the US Allied Air Force assets in the Southwest Pacific Theater.⁴⁵ This did two things. First, there was a perception that the mixed US-Australian Allied Air Force command structure was both confusing and led to Australians commanding American forces. The Fifth Air Force segregated the two nation's Airmen and command structures. Second, it permitted the US and Australian forces to divide areas of operation geographically. Kenney remained the Allied Air Forces commander and on 9 August 1942, he became the Fifth Air Force commander as well. Overall, this change met Kenney's desire to increase the fighting effectiveness of his forces while conforming to MacArthur's desire to reduce Australian control over US forces.⁴⁶ Now that Kenney's organizational problems were under control, he began focusing on supply and equipment issues.

General Kenney needed to tackle the challenges posed by the Europe-first policy. In 1942 the "Europe-first policy meant that few replacement aircraft, let alone additional combat groups, would be available for the foreseeable future. Those aircraft that survived early combat were badly in need of repair and in their present configuration, ill-suited for warfare" in the Southwest Pacific Theater.⁴⁷ Soon after

⁴⁴ Ahmann, Eubank Oral History Interview; 106; Mark C. Cleary, Lt Gen Francis C. Gideon Oral History Interview Appendix, USAF Historical Research Agency, K239.0512-1338, 6-7; Kenney, Diary, 29 July 1942; Kenney, Papers, 29 July 1942, Micfilm 27131, Frame 0055. ;Wolk, "George C. Kenney," 93; Stephens, "George C. Kenney," 77; Wolk, "Other Founding Father," 169.

⁴⁵ Bergerud, *Fire in the Sky*, 381; Kenney, *General Kenney Reports*, 63; Rodman, *A War of Their Own*, 26; Stanley, General George C. Kenney Oral History Interview, 24.

⁴⁶ Griffith, *MacArthur's Airman*, 61; James, "Oral Reminiscences," 15; Kenney, Diary, 29 July 1942; Stanley, General George C. Kenney Oral History Interview, 23-24; Stephens, "George C. Kenney," 79.

⁴⁷ Mark C. Cleary, Lt Gen Robert G. Ruegg Oral History Interview, USAF Historical Research Agency, K239.0512-1571, 17; Timothy D. Gann, *Fifth Air Force Light and Medium Bomber Operations During 1942 and 1943: Building Doctrine and Forces that*

Kenney arrived in Australia, he discovered a significant problem in the supply system. "He knew that the rear supply area was holding back equipment, figuring that New Guinea would be lost anyway, and that the supplies would eventually be required for the defense of Australia."⁴⁸ He discovered aircraft in New Guinea missing critical components or sitting idly with battle damage, preventing the aircraft from being effective tools of combat. He found that even when parts were available in the rear areas, the supply depots often either refused to fill the orders or claimed personnel filled the paperwork out incorrectly. He immediately corrected this issue, directing the supply headquarters to fill all orders regardless of the correctness of the paperwork, saying, "wars . . . were not won by file cabinets."⁴⁹ Herman S. Wolk describes Kenney's impact during the early days of World War II in the Southwest Pacific Theater:

When Kenney arrived in the Southwest Pacific in the summer of 1942, MacArthur's air forces were a shambles. The theater commander had no confidence in General Brett and little communication with him. Kenney changed this situation. He made the air setup comprehensible; he brought in "operators" . . . who knew how to run combat air forces; and he straightened out the entire logistical swamp, making supply and maintenance supportive of air operations.⁵⁰

One man had been fighting these issues since the beginning of the war and he would be a big part of Kenney's solution. Major Paul I. "Pappy" Gunn once said, "Until [General Kenney] came along, I had to fight with every quartermaster in Australia. After he took command, the

Triumphed in the Battle of the Bismarck Sea and the Wewak Raid (Air University: School of Advanced Airpower Studies, 1992), 1; Wolk, "Other Founding Father," 169.

⁴⁸ Kenney, Diary, 5 August 1942; Stanley, General George C. Kenney Oral History Interview, 23; Wolk, "George C. Kenney," 95.

⁴⁹ Kenney, Diary, 5 August 1942; Kenney, *General Kenney Reports*, 79; Kenney, Papers, 29 July 1942, Micfilm 27131, Frame 0095; Stephens, "George C. Kenney," 89; Wolk, "George C. Kenney," 95; Wolk, "Other Founding Father," 170.

⁵⁰ Wolk, "George C. Kenney," 113-114.

doors were open and the sky was the limit.”⁵¹ In Kenney’s eyes, Pappy Gunn was a “godsend . . . as a super-experimental gadgeteer and all-around fixer. There was absolutely nothing that fazed Pappy. If you asked him to mount a sixteen-inch coast-defense rifle in an airplane, Pappy would grin, figure out how to do it, work day and night until the job was finished, and then test the installation by flying it himself against the [Japanese] to see how it worked.”⁵² Gunn fit right in with Kenney’s desire to instill “a spirit of innovation throughout the command.”⁵³

General Kenney met Pappy Gunn on 5 August 1942 while inspecting the Third Attack Group at Charters Towers airdrome in Queensland, Australia. The Third Attack Group’s commander, Colonel Jim Davies, introduced the two after General Kenney heard about a man who could fix any airplane no matter what the ailment. Moreover, he was making aircraft improvements along the way.⁵⁴ Pappy Gunn was the perfect man for solving one of Kenney’s most pressing problems.

General Kenney asked Pappy Gunn to report to Brisbane for an urgent assignment on 21 August 1942. Kenney had 170 damaged aircraft at an airfield west of Brisbane. They were awaiting salvage, but Kenney hoped Gunn might be able to get some of them operating again since he currently had only 75 operational fighters in the squadrons. Kenney managed to get Gunn access to local tool shops and metalworkers to help in the effort. According to Kenney, Pappy Gunn was able to reclaim more than 100 of those aircraft, sending them to New Guinea. These aircraft played a critical role in the protection of Australia from the expected Japanese invasion.⁵⁵

⁵¹ Nathaniel Gunn, *Pappy Gunn* (Bloomington, IN: AuthorHouse, 2004), 439.

⁵² Kenney, *General Kenney Reports*, 77; Stephens, “George C. Kenney,” 86.

⁵³ Rodman, *A War of Their Own*, 25; Stephens, “George C. Kenney,” 86.

⁵⁴ Kenney, *Diary*, 5 August 1942; George C. Kenney, *The Saga of Pappy Gunn* (New York: Van Rees Press, 1959), 45-46.

⁵⁵ Kenney, *Saga of Pappy Gunn*, 51.

Kenney also worked in concert with the “Europe First” policy. Knowing his forces would be a second priority for the foreseeable future, he looked for equipment that was not popular in Europe, but might be useful in the Pacific. This approach gave the Allied Air Forces access to B-24 Liberators, P-38 Lightnings, and as many B-25 Mitchells and A-20 Havocs as Arnold would give him. Australian historian Alan Stephens suggests this “kind of firsthand intervention into logistical problems was a distinctive feature of Kenney’s leadership style.” Stephens also notes Kenney’s focus on parachute-fragmentation bombs, skip-bombing tactics, and commerce destroyer aircraft like the future B-25.⁵⁶

General Kenney’s technological background, logistics focus, and support for innovative thinkers produced great results early in the war. This environment was necessary for the B-25 to begin its metamorphosis into a commerce destroyer. It does not reveal, however, the need for such action. The ineffectiveness of the Army Air Corps’ doctrinal bombing tactics created the operational requirement for innovative B-25 employment.

A tipping point in bombing tactics arrived in July and August 1942. The Japanese were landing thousands of troops on Papua, New Guinea. The Allies were using the old AAC tactic of massing large formations of bombers to attack the ships.⁵⁷ The allied bombers attacked the Japanese convoys from 25,000 feet with ten B-17 Flying Fortresses, five North American B-25 Mitchells, and six Martin B-26 Marauders. Despite repeated efforts, they only managed to hit one transport ship.⁵⁸ As the Japanese continued to build up forces for a drive towards Port Moresby, the Allies continued their air attacks to cut off Japanese supply lines. During the month of August, only 19 of 434

⁵⁶ James, “Oral Reminiscences,” 44; Alan Stephens, “George C. Kenney: ‘A Kind of Renaissance Airman,’” in *Air Commanders*, ed. John Andreas Olsen (Washington DC: Potomac Books, 2013), 90.

⁵⁷ Rodman, *A War of Their Own*, 27, 57-58.

⁵⁸ Gann, *Fifth Air Force Light and Medium Bomber Operations During 1942 and 1943*, 4.

bombs hit their target, sinking only one transport and one cargo ship. The following month showed no improvement. Only nine of 425 bombs found their targets in September, sinking a single cargo ship.⁵⁹ During this period of ineffectiveness, the Fifth Air Force began to discard old tactics and look for new and more effective ones.

The ineffectiveness of current bombing techniques was the driving force behind new tactics. The high altitude bombing tactics proved ineffective against maneuvering ships.⁶⁰ Bombing from lower altitudes would improve accuracy and decrease the ability of the Japanese ships to maneuver before the bombs hit their target. A lower altitude, however, made Allied aircraft more vulnerable to the ships' defensive firepower.⁶¹

The Japanese continued their attacks while Allied bombing remained ineffective. They launched assaults on Papua, New Guinea on 21 July 1942. The Japanese based their aircraft on four runways around Rabaul, while the Allies flew all their sorties from Port Moresby. Port Moresby was within range of Japanese aircraft and could not support all allied aircraft, so it served as a refueling and rearming base for allied aircraft based in Australia.⁶² Port Moresby was an incredibly important airfield to the Allies. MacArthur, unlike many others, felt the Allied last line of defense would be in New Guinea rather than in Australia. Port Moresby was the only airfield within striking range of the Japanese.⁶³ Aircraft based in Australia landed in Port Moresby to refuel

⁵⁹ Gann, *Fifth Air Force Light and Medium Bomber Operations During 1942 and 1943*, 5.

⁶⁰ Kenney, Diary, 13 August 1942; Lieutenant General George C. Kenney to General Henry H. Arnold, Letter, 27 November 1942, in Kenney, Diary, 27 November 1942; Lex McAuley, *Battle of the Bismarck Sea* (New York: St. Martin's, 1991), 20; Rodman, *A War of Their Own*, 28; Stanley, General George C. Kenney Oral History Interview, 7.

⁶¹ Kenney to Arnold, Letter, 27 November 1942, in Kenney, Diary, 27 November 1942.

⁶² Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 4, *The Pacific: Guadalcanal to Saipan, August 1942 to July 1944* (Washington, DC: Office of Air Force History, 1983), 21-24; Griffith, *MacArthur's Airman*, 72; Dorris Clayton James, *The Years of MacArthur* (Boston: Houghton Mifflin, 1970), 191-192; Samuel Milner, *The United States Army in World War II: The Pacific: Victory in Papua* (Washington DC: Office of the Chief of Military History, Department of the Army, 1957), 50.

⁶³ Mark C. Cleary, Lt Gen Francis C. Gideon Oral History Interview, USAF

and rearm before attacking the Japanese. Thus, the Japanese landings at Buna and subsequent march south towards Port Moresby were a serious concern to all Allied leaders.

Kenney took command of the Allied Air Forces during the Japanese attacks and outlined his four primary tasks. First, Allied Air Forces needed to remove the Japanese air threat, allowing freedom for both allied air and ground forces to attack and defend without fear of air attack. Second, they needed to attack Japanese shipping. Japanese forces landing on Papua would need resupply, as would their forces stationed on nearby islands. Attacking the shipping lanes would strangle their logistics lines. Next, the Allied Air Forces had to support their ground counterparts by attacking Japanese ground forces who were preparing to march across the island and take Port Moresby. Finally, Kenney needed to support MacArthur's ground forces by airlifting troops and supplies to the battlefield.⁶⁴ Traditional high altitude bombing tactics remained ineffective as the Japanese continued their assault on Papua. Kenney, with his primary tasks in mind, needed to apply airpower more effectively in a theater with unique challenges.

The Japanese home islands were beyond the range of Allied aircraft based in New Guinea. The distance posed problems for both the Japanese and the Allies. The Japanese relied heavily on their long logistics lines. They did not have forward-based manufacturing capabilities or other resources; therefore, their logistics lines were their lifeblood. The Allies could not apply strategic high-altitude bombing doctrine to attack the Japanese home islands or the military-industrial targets housed there.⁶⁵ Furthermore, high-altitude bombing was proving difficult against the few targets within range of Allied aircraft.

Historical Research Agency, Call: K239.0512-1338, 24-25.

⁶⁴ Griffith, *MacArthur's Airman*, 74; Rodman, *A War of Their Own*, 24, 40; Wolk, "Other Founding Father," 169.

⁶⁵ Griffith, *MacArthur's Airman*, 74-75; Kenney, *The MacArthur I Know*, 52; Rodman, *A War of Their Own*, 14, 76.

As mentioned earlier, high-altitude bombing failed to stop the Japanese landings in Papua, New Guinea. Air officers estimated they needed nine aircraft to hit a single maneuvering Japanese ship. Kenney, however, rarely cobbled together nine bombers for attacks on an entire convoy. Furthermore, cloud ceilings between 1,200 and 2,000 feet often obscured ground and maritime targets, making them difficult to find and target for high-altitude bombers.⁶⁶ While searching for targets, the bombers were vulnerable to Japanese fighters. Fortunately, Kenney's history of innovative thinking and work with low-altitude bombing allowed him to address these issues immediately.

Kenney applied new tactics and began work on other innovations soon after his arrival. His units moved their attacks to the hours of darkness to avoid Japanese fighters and began researching low-altitude skip bombing to get under the weather and improve bombing accuracy.⁶⁷ The technique involved flying about 200 feet above the water and dropping the bombs so they skipped across the water, either impacting the side of the ship or sinking just below the water line before the delay fuse detonated the bomb.⁶⁸ Conveniently, the Army Air Forces approved skip-bombing tactics in July 1942.⁶⁹ Kenney has taken sole credit for the skip-bombing innovation in some of his writings, but the tactic was born elsewhere.⁷⁰ By this time, the United Kingdom's Royal Air Force

⁶⁶ Cleary, Lt Gen Francis C. Gideon Oral History Interview, 23; Griffith, *MacArthur's Airman*, 81; Hasdorff, General George C. Kenney Oral History Interview, 77; Major General George C. Kenney to General Henry Arnold, letter, 27 November 1942, General George C. Kenney Papers, USAF Historical Research Agency, Call: Micfilm 27131, Frame 352; Rodman, *A War of Their Own*, 29, 58; Stanley, General George C. Kenney Oral History Interview, 7; Stephens, "George C. Kenney," 91.

⁶⁷ Kenney to Arnold, Letter, 27 November 1942, in Kenney, *Diary*, 27 November 1942; George C. Kenney to Muir S. Fairchild, letter, 8 December 1942, General George C. Kenney Papers, USAF Historical Research Agency, Call: Micfilm 27131, Frame 370; Stephens, "George C. Kenney," 91.

⁶⁸ Rodman, *A War of Their Own*, 32.

⁶⁹ Cleary, Gideon Oral History Interview, 36; Bruce Gamble, *Fortress Rabaul: The Battle for the Southwest Pacific, January 1942-April 1943* (Minneapolis, MN: Zenith Press, 2010), 292-293; Griffith, *MacArthur's Airman*, 82; Rodman, *A War of Their Own*, 37.

⁷⁰ Cleary, Gideon Oral History Interview, 36; Kenney, *General Kenney Reports*, 21-22; Stanley, Kenney Oral History Interview, 7.

had already used light bombers using skip-bombing tactics against German ships. The Royal Australian Air Force attacked two Japanese ships in a mast-height attack on 11 February 1942.⁷¹ Thus, despite Kenney's claims, other airmen were experimenting with the mast-height skip-bombing tactics prior to his arrival in the Southwest Pacific Theater. Though Kenney's aircraft could fly low-altitude bombing missions in theory, the aircraft required modifications to be truly successful in practice.

A-20 Havoc aircraft flew the first tests of low-altitude skip-bombing tactics. B-17s perfected the techniques but had problems of their own.⁷² Kenney needed to adapt his current fleet of aircraft for the new mission. Kenney's 3,000 parachute-fragmentation bombs arrived around 21 August 1942. None of the Allied Air Force's aircraft had the special racks needed to carry the bombs. Kenney directed Pappy Gunn to modify the A-20's bomb racks for this purpose. It is not clear whether this modification was already underway when Kenney met Pappy Gunn on 5 August, or whether this was an additional change to Gunn's rack modifications. Gunn completed the rack modifications on 3 September 1942.⁷³ Kenney's problems, however, were not limited to aircraft modifications.

On 8 September 1942, Kenney received the P-38s General Arnold promised to send to the Pacific. They arrived with leaking fuel tanks and without the ammunition feeds for the guns. Allied maintainers had to manufacture new fuel tanks and ammunition feeds in theater. Six B-25s also arrived, but had no guns, gun mounts, or bombsights, making them

⁷¹ McAulay, *Battle of the Bismarck Sea*, 21; Rodman, *A War of Their Own*, 36.

⁷² Cleary, Gideon Oral History Interview, 32; Griffith, *MacArthur's Airman*, 82; Rodman, *A War of Their Own*, 34.

⁷³ John S. Alcorn, "The Grim Reapers: Part I," *American Aviation Historical Society Journal* vol. 20, no. 1 (Spring 1975), 12; Birdsall, *Flying Buccaneers*, 20; Hasdorff, General George C. Kenney Oral History Interview, 74; Kenney, *General Kenney Reports*, 76, 82; Stanley, General George C. Kenney Oral History Interview, 8; Wolk, "Other Founding Father," 169.

useless.⁷⁴ Kenney later stated that ten B-25s needed bombsights.⁷⁵ Again, Pappy Gunn found a solution.

Gunn would never tell Kenney exactly how he acquired the bombsights, but Kenney was aware of some of the details. Gunn and his trusted sidekick, Sergeant Evans, took a DC-2 transport aircraft to Canberra, Australia. Gunn heard the Dutch had 12 B-25s used for training there. He and Sergeant Evans flew to Canberra, returned with 12 bombsights, and installed them on the B-25s (more on this in the next chapter).⁷⁶ Shortly thereafter, the Fifth Air Force employed B-25s successfully in a raid against Japanese shipping in Davao Harbor, Philippines. Kenney's writings regularly cite the innovative contributions Pappy Gunn made to the Allies' successful campaign against Japanese shipping. Kenney's top-down support for operationally focused individuals and their ideas allowed Gunn to innovate from the bottom-up, often taking action without orders from his superiors.

The 89th Attack Squadron tested Kenney's parachute-fragmentation bombs with Gunn's bomb racks for the first time on 12 September 1942. The squadron flew nine A-20s against Buna airfield near where the Japanese landed in Papua, New Guinea. They destroyed 17 Japanese aircraft on the ground, and later attacks by B-17s and B-26s put the airfield out of commission.⁷⁷ The new tactics were evolving, but were not nearly complete.

On 20 September 1942, Kenney returned his focus to skip-bombing. He flew a sortie with Major William Benn against a shipwreck in Port Moresby Harbor frequently used as a target. They learned the tactic was effective, but they needed to fine-tune the appropriate drop

⁷⁴ Kenney, *General Kenney Reports*, 90.

⁷⁵ Kenney, *Saga of Pappy Gunn*, 43.

⁷⁶ Alcorn, "The Grim Reapers: Part I," 7; Kenney, *Saga of Pappy Gunn*, 44. Note: Kenney describes this event as occurring in September 1942 in *General Kenney Reports*, 90. In *The Saga of Pappy Gunn*, Kenney describes the story as occurring in April, 1942, before Kenney's arrival in the Southwest Pacific Theater.

⁷⁷ Kenney, *General Kenney Reports*, 93.

altitude and bomb-fuse timing. Some of the bombs tended to skip over the ship and explode on the far side, or exploded before reaching the ship.⁷⁸ On the 30th of that month, General MacArthur recognized Kenney's innovative leadership and combat successes by recommending him for Lieutenant General. MacArthur wrote:

Chief of Staff

War Department, Washington, D.C.

Recommend the promotion to Lieutenant General of Major General George C. Kenney, 0-8940. This officer commands the Allied Air Force, composed of the Fifth Air Force and the Royal Australian Air Force, South West Pacific Area. His position justifies the rank of Lieutenant General. Allied Land Forces and Allied Naval Forces, the latter of far less strength than the Air Forces, are commanded by men of corresponding or higher rank. General Kenney has demonstrated superior qualities of leadership and professional ability.

MacArthur⁷⁹

Kenney, in fact, became adept at solving problems for MacArthur before MacArthur even knew they existed. In one example, Kenney was tasked to move supplies from Marilinan to Tsili-Tsili. Initially, they flew in jeeps and trailers, but these smaller vehicles were too small for their needs. The two and a half ton trucks were too large for the DC-3 transports, so Kenney's men cut them in half. They put the pieces in the DC-3, then welded and bolted them back together at the destination. This worked so well Kenney modified all the trucks to become air-mobile. Upon learning of this feat, MacArthur remarked that if "he told [Kenney] to move New York to the West coast and re-erect it there, the Fifth Air Force would figure out a way to do it."⁸⁰ Examples like this fostered a close, trusting relationship between MacArthur and Kenney.

⁷⁸ Cleary, Lt Gen Francis C. Gideon Oral History Interview, 35; Kenney, *General Kenney Reports*, 105.

⁷⁹ Kenney, *General Kenney Reports*, 117; Stephens, "George C. Kenney," 78.

⁸⁰ Kenney, *General Kenney Reports*, 270; Stephens, "George C. Kenney," 84.

By mid-November 1942, Kenney concluded the B-17 bombers did not have enough forward-firing guns to protect them on the low-altitude skip-bombing runs. Kenney decided to modify the B-25 bombers and make them into “commerce destroyers.”⁸¹ These B-25s were the original C-model B-25s, often referred to as B-25C1s, with the .30-caliber flexible nose machine gun. As mentioned in the previous chapter, North American Aviation began installing different guns in the nose and updated turrets later. Kenney told Gunn to add four .50-caliber machine guns to the nose of the aircraft, three .50-caliber guns underneath, and two pairs of .50-caliber guns on each side of the fuselage. Kenney believed the aircraft would be able to overwhelm the deck defenses of the Japanese ships before destroying it with the aircraft’s bombs. “With a commerce destroyer as effective as . . . this would be, [he would] be able to maintain an air blockade on the [Japanese] anywhere within the radius of action of the airplane.”⁸² Pappy Gunn immediately went to work on the project.

On 29 November 1942, Kenney inspected Gunn’s progress on the commerce destroyer B-25. Gunn mounted four .50-caliber machine guns in the nose and two more on each side of the fuselage. The guns beneath the fuselage were left off due to ammunition feed problems. Each gun had 500 rounds of ammunition.⁸³ To make all this work, Gunn removed the bombardier and the bombsight. On 9 December, Kenney returned in time to see Gunn landing the aircraft after a test flight. The aircraft looked nose-heavy after all the modifications. Kenney

⁸¹ Alcorn, “The Grim Reapers: Part I,” 14; Birdsall, *Flying Buccaneers*, 50; Cleary, Ruegg Oral History Interview, 28; Cleary, Gideon Oral History Interview, 36; Goodard, Kenney Oral History Interview, 15; Kenney, Diary, 5 August 1942; Kenney to Arnold, Letter, 27 November 1942, in Kenney, Diary, 27 November 1942; Kenney, *Saga of Pappy Gunn*, 54; McAulay, *Battle of the Bismarck Sea*, 20; Stephens, “George C. Kenney,” 91.

⁸² Alcorn, “The Grim Reapers: Part I,” 14; Birdsall, *Flying Buccaneers*, 50; Cleary, Gideon Oral History Interview, 36; Kenney, *General Kenney Reports*, 144; Perret, *Winged Victory*, 421; Rodman, *A War of Their Own*, 42; Stephens, “George C. Kenney,” 91.

⁸³ Gamble, *Fortress Rabaul*, 300; Kenney, *General Kenney Reports*, 155.

commented on the center of gravity to which Gunn replied, "Oh, the C.G. Hell, General, we threw that away to save weight."⁸⁴ Gunn did make changes to the aircraft to move the center of gravity towards the rear of the aircraft. He moved the package-guns from the sides of the fuselage back and installed a 200-gallon gasoline tank behind the wings. This balanced the aircraft and increased its range.⁸⁵ The middle of December 1942, Gunn told Kenney he was ready to demonstrate the aircraft to the Third Attack Group at Charters Towers, Australia. Though most of Kenney's writings give himself the credit for the innovative ideas and relegate Gunn to the role of engineer and maintenance officer, he does state, "Pappy Gunn came up with the commerce-destroying B-25."⁸⁶

Around 17 December, Kenney ordered Captain Ed Larner of the 89th Attack Squadron, Third Attack Group to go to Australia with Gunn, help him with any further testing and "learn to like the airplane."⁸⁷ Larner returned the B-25 to Port Moresby on 29 December 1942. Kenney told him to sell the airplane and the new strafing and low-level bombing tactics to the 90th Bomb Squadron.⁸⁸ Kenney expected them to practice bombing on the shipwreck in the Port Moresby Harbor until they "didn't miss," and then they would send the aircraft against a Japanese convoy.⁸⁹ During this period, B-17s and P-38s continued to engage Japanese fighters while attempting to bomb and strafe Japanese ships. They were successful in shooting down many fighters, but also continued to lose B-17s.⁹⁰ Kenney needed the B-25 in action soon.

⁸⁴ Bergerud, *Fire in the Sky*, 291; Birdsall, *Flying Buccaneers*, 50; Cleary, Ruegg Oral History Interview, 28; Cleary, Gideon Oral History Interview, 36; Kenney, *Saga of Pappy Gunn*, 55.

⁸⁵ Birdsall, *Flying Buccaneers*, 50; Kenney, *Saga of Pappy Gunn*, 56.

⁸⁶ Kenney, *General Kenney Reports*, 169.

⁸⁷ Gamble, *Fortress Rabaul*, 300; Kenney, *General Kenney Reports*, 169; McAulay, *Battle of the Bismarck Sea*, 21.

⁸⁸ Alcorn, "The Grim Reapers: Part I," 14; Birdsall, *Flying Buccaneers*, 51; McAulay, *Battle of the Bismarck Sea*, 21; Rodman, *A War of Their Own*, 60.

⁸⁹ Kenney, *General Kenney Reports*, 173; Perret, *Winged Victory*, 421.

⁹⁰ Kenney, *General Kenney Reports*, 177.

In January 1943, General MacArthur reconsidered an issue upon which he and Kenney previously disagreed. In 1932, Kenney advocated for an independent Air Force while working in Washington DC. MacArthur was strongly opposed to the idea. In the Southwest Pacific Theater, Kenney and one of MacArthur's subordinates were arguing about the importance of an independent Air Force. MacArthur "broke into the conversation and said that a single department was the proper organization and that the Air should be separated and have the same autonomy as the land and sea forces."⁹¹ At the beginning of the war, MacArthur was critical of the Allied Air Forces. The organization, under Kenney's leadership, was clearly making him change his mind. This is most remarkable given the struggles Kenney was having. In January, Kenney wrote General Arnold to update him on his need for more airplanes. Kenney received 89 airplanes in the previous three months, but lost 146 to a variety of causes.⁹² He was sliding backwards, and although his unique leadership and innovative use of aircraft was increasingly effective, it remained a losing battle.

The Battle of the Bismarck Sea gave Kenney the opportunity to demonstrate the effectiveness of his innovations. Gunn's commerce destroyer B-25s were ready for action. The forward firepower changed light and medium bombers into strafers and the parachute-fragmentation bombs significantly altered the aircraft's role in combat.⁹³ Major Ed Larner demonstrated the B-25s against the shipwreck in Port Moresby Harbor and, as directed, they did not miss. At the end of February 1943, Kenney notified MacArthur of impending poor weather. Kenney thought the Japanese would move their forces under the cover of the weather. Kenney planned a coordinated attack. Heavy bombers would drop their bombs just before the B-25s began their low-altitude

⁹¹ Kenney, *General Kenney Reports*, 178.

⁹² Kenney, *General Kenney Reports*, 185.

⁹³ Rodman, *A War of Their Own*, 44.

skip-bombing attack. After the B-25s passed, A-20s and Australian Beaufighters would follow up the attack. Kenney assigned P-38s as cover for all the bombers. He knew the coordinated attack was extremely complex and depended heavily on timing. He organized a dress rehearsal for the operation and they fixed any problems found with the plan.⁹⁴ Kenney had his aircraft, and a plan. They needed to find the Japanese.

On 26 February, a reconnaissance aircraft spotted a small, seven-ship convoy near Rabaul. They spotted the convoy again on 27 February and continued to track it, hoping it would get closer and allow them to attack. Then, on 1 March 1943, they found the convoy again. It had grown to become six Japanese destroyers and eight transport ships. The Allies attacked the convoy on 1 and 2 March with heavy bombers from high altitude. They sank or damaged several vessels while the Japanese continued to add more ships to the convoy. On 3 March, reconnaissance aircraft found eight destroyers escorting eight transport ships. At ten o'clock, Kenney's Allied Air Forces began their coordinated attack.

The attack unfolded much like the original plan. Eighteen heavy bombers and twenty medium bombers attacked from 7,000 feet. Just after their bombs hit, thirteen Australian Beaufighters strafed the convoy from low altitude. Ed Larner followed with twelve B-25s followed by twelve A-20s. The low-altitude tactics paid off. Seventeen of the 37 500-pound bombs dropped by the B-25s found their target. The A-20s made direct hits with 11 of their 20 bombs. During the 20-minute battle, Allied bombers sunk or heavily damaged every Japanese transport ship. One Japanese destroyer sank while three others were hit by skip-bombing attacks. The low-altitude bombers heavily strafed every Japanese vessel.⁹⁵ The B-25s alone sank four transport ships and hit or

⁹⁴ Kenney, *General Kenney Reports*, 199; Stephens, "George C. Kenney," 93.

⁹⁵ John S. Alcorn, "The Grim Reapers: Part II," *American Aviation Historical Society Journal* vol. 20, no. 3 (Fall 1975), 188-189; Kenney, *General Kenney Reports*, 203-204.

sunk two destroyers in the first 15 minutes of the battle. All twelve B-25s returned safely.⁹⁶

The B-25s were well equipped for this type of battle. Each aircraft carried three or four bombs. The eight forward-firing .50-caliber machine guns held 500 rounds with a sequence of one tracer, two armor piercing, and two incendiary rounds.⁹⁷ The crews' experience was harrowing and one example is worth relaying in whole:

Lieutenant Ray Moore selected a five-thousand-ton transport. He made a gentle turn away from a destroyer screening it and then began a power glide from four thousand feet to gather speed. At a thousand feet he turned parallel to his target and flew a descending course which put the B-25 at right angles to the ship. Moore swung sharply to the left and made a direct run in. Pouring on all the power he corkscrewed his B-25, skidding from one side to the other and jinking up and down. In range he opened fire, and the bullets sprayed over the ship. The decks of the transport were covered with enemy troops, lined up with their rifles in their hands. As the machine guns blazed from between the teeth of the leering shark mouth painted on the Mitchell's nose they slumped in heaps on the decks or tumbled over the side.

Moore stopped firing as the target drew close and he could no longer hold his B-25 in a firing position and make an effective bomb run too. His co-pilot opened the bomb bay and Moore made a gradual pull-up to avoid the mast of the ship as he released the bombs. They slammed into the water, skipped at the side of the ship, and exploded, rocking the vessel violently and leaving a huge hole at the waterline. Moore made a steep climbing turn to the left to sidestep a nearby destroyer, at the same time veering away from the target. His crew saw the ship was sinking as he pulled away.⁹⁸

The Allies launched a second attack on the afternoon of 3 March. At this point, there were two remaining Japanese destroyers and four or

⁹⁶ Kenney, *Saga of Pappy Gunn*, 60.

⁹⁷ Birdsall, *Flying Buccaneers*, 57.

⁹⁸ Birdsall, *Flying Buccaneers*, 58.

five burning transport ships. Ten B-25s with 16 heavy bombers, 12 medium bombers, five Australian Beaufighters, and 11 P-38s attacked the remaining ships. By morning, only one destroyer was left afloat, but sinking. A B-25 returned that morning and sank the destroyer. The Battle of the Bismarck Sea was over in just one day. Kenney's new tactics proved to be highly successful even against the Japanese maneuvering ships. The P-38s were able to keep the Japanese fighters busy and allow the low-level bombers to exact a deadly toll on the Japanese convoy.⁹⁹ "The scene from the sea was horrific. Flames engulfed merchant vessels and, as one Japanese sailor recalled, 'whole ships blew up.'"¹⁰⁰ The Battle of the Bismarck Sea took the following toll on Japanese and Allied forces:

⁹⁹ John S. Alcorn, "The Grim Reapers: Part II," *American Aviation Historical Society Journal* vol. 20, no. 3 (Fall 1975), 189; Kenney, *General Kenney Reports*, 204-205.

¹⁰⁰ Haruko Taya Cook and Theodore Failer Cook, *Japan at War: An Oral History* (New York: New Press, 1992), 301; Griffith, *MacArthur's Airman*, 106.

Japanese Losses:

- 4 destroyers, sunk
- 4 destroyers, possibly damaged
- 8 transport ships, sunk
- 1 transport ship destroyed in Wide Bay
- 1 transport ship destroyed in Lae Harbor
- 59 aircraft definitely destroyed
- 25 aircraft probably destroyed
- 10 aircraft damaged
- 12,762 personnel (US estimate)
- 3,000-5,000 personnel (Japanese estimate)¹⁰¹

Allied Losses:

- 4 aircraft shot down (3 P-38s & 1 B-17)
- 2 aircraft crash-landed at home airfield
- 13 personnel killed
- 12 personnel wounded¹⁰²

The Allied Air Force aircraft returned to the area for several days strafing lifeboats and rafts carrying Japanese soldiers. “The bloody but necessary business would continue because survivors still amounted to a large enough force to represent a danger if they could reach land.”¹⁰³ Kenney felt no remorse in these acts, believing that “the Japanese asks no quarter and expects none. His psychology is [to] win or perish.”¹⁰⁴

The Battle of the Bismarck Sea was an astounding success, both tactical and strategic. The Japanese loss figures vary from one account to the next. Regardless of the true numbers, the Japanese suffered a significant loss in the Bismarck Sea. The Japanese attempted one more

¹⁰¹ Alcorn, “The Grim Reapers: Part II,” 189; Cook and Cook, *Japan at War*, 301; Craven and Cate, *The Army Air Forces in World War II*, vol. 4, 149; James, “Oral Reminiscences,” 22; Kenney, *General Kenney Reports*, 205; McAulay, *Battle of the Bismarck Sea*, 156; Perret, *Winged Victory*, 422; Rodman, *A War of Their Own*, 70; Stanley, General George C. Kenney Oral History Interview, 35; Stephens, “George C. Kenney,” 95; Note: Kenney’s initial battle damage reports were overly optimistic; MacArthur’s staff provided corrections later.

¹⁰² Craven and Cate, *The Army Air Forces in World War II*, vol. 4, 144; Kenney, *General Kenney Reports*, 206; Rodman, *A War of Their Own*, 70; Stephens, “George C. Kenney,” 95.

¹⁰³ Alcorn, “The Grim Reapers: Part II,” 189; Birdsall, *Flying Buccaneers*, 62-63; Stephens, “George C. Kenney,” 96.

¹⁰⁴ Griffith, *MacArthur’s Airman*, 107.

convoy, after which they decided to rely on single ship efforts, which made them easy prey for later bombing attacks. “Because Japanese supplies and reinforcements could not reach eastern New Guinea without the threat of significant losses due to air attack, the Japanese went on the defensive, and the initiative passed to the [Allies].”¹⁰⁵ With the initiative came offensive operations. These operations created forward basing opportunities for Allied light and medium bombers. Basing was of strategic importance because it placed more Japanese shipping, logistics lines, and airfields within range of Allied bombers, thus clearing the way for more offensive action. This type of action “defined the method that came to be known as MacArthur’s island-hopping strategy.”¹⁰⁶ Importantly, bombing accuracy improved greatly. Low-altitude mast-height attacks scored 48 hits for 137 bombs dropped, while high-altitude attacks hit their target with less than ten percent of their bombs.¹⁰⁷ “One fact has never been challenged – the important fact that the convoy was annihilated by Allied air power.”¹⁰⁸

The day after the Battle of the Bismarck Sea, 4 March 1943, Lieutenant General Kenney left Brisbane for a trip to Washington DC. This trip set the wheels in motion for even more changes to the B-25C. Before leaving Australia, Kenney sent General Arnold a letter with drawings of the B-25 changes they made in the Southwest Pacific Theater. Kenney hoped Arnold would ask Dutch Kindelberger to make the changes at the factory.¹⁰⁹ Dutch Kindelberger was the president of North American Aviation and responsible for the factory building B-25Cs

¹⁰⁵ Ahmann, Eubank Oral History Interview, 117; Bergerud, *Fire in the Sky*, 607; Rodman, *A War of Their Own*, 72, 75; Stanley, Kenney Oral History Interview, 35; Stephens, “George C. Kenney,” 95.

¹⁰⁶ Gamble, *Fortress Rabaul*, 291; Rodman, *A War of Their Own*, 84; Stephens, “George C. Kenney,” 82.

¹⁰⁷ Rodman, *A War of Their Own*, 69.

¹⁰⁸ Birdsall, *Flying Buccaneers*, 64.

¹⁰⁹ Kenney, *General Kenney Reports*, 214.

in Inglewood, California.¹¹⁰ Doing so would save Kenney the trouble of removing aircraft from operational flying for their upgrades. They would arrive ready to fight.

While Kenney was in Washington DC, Arnold asked him to come to his office. Arnold already had “a battery of engineering experts from Wright Field” in his office ready to discuss Kenney’s proposed B-25C modifications. The experts explained to Kenney that the idea was unsound. The positioning of the guns would upset the center of gravity and the plane would be dangerous to fly. Kenney let them drone on for a while before interjecting. He explained that he had already modified the aircraft and they played a critical role in the Battle of the Bismarck Sea victory. Arnold angrily dismissed his engineering experts before asking Kenney to send Pappy Gunn to the US to show the engineers at Wright Field and Dutch Kindelberger at the Inglewood production plant how to modify the aircraft.¹¹¹ Kenney agreed to send Gunn to the US for a month and Arnold said they would begin the modifications as soon as Gunn arrived.¹¹²

The combination of Gunn’s modifications and upgrades in the factory resulted in changes to the B-25C & D models, and the B-25G with a 75-mm cannon arrived in July 1943. That fall, the B-25C/D/G continued fighting with great success. There are innumerable accounts of successful attacks on airfields, ships, and ground defenses. They were also highly successful against Japanese fighters, often shooting them down. The attack on Nazdab on 5 September 1943 showcased the devastating capability of the B-25 in a coordinated attack with other air platforms.

The attack on Nazdab was an Allied effort to move 1,700 paratroopers into position to engage the Japanese and take control of a

¹¹⁰ Boeing, “James Howard ‘Dutch’ Kindelberger,” <http://www.boeing.com/boeing/history/bna/biog.page> (accessed 18 March 2013).

¹¹¹ Kenney, *General Kenney Reports*, 214-215; Rodman, *A War of Their Own*, 83.

¹¹² Kenney, *Saga of Pappy Gunn*, 62; Rodman, *A War of Their Own*, 82.

new airfield. It included 302 aircraft in all with six squadrons of B-25s. In a letter to General Arnold, Kenney describes the B-25s leading all other aircraft with their eight nose-mounted .50-caliber machine guns. They then dropped 60 of Kenney's parachute-fragmentation bombs. Modified A-20s followed the B-25s laying smoke to mask the arrival of 96 C-47s and the paratroopers. B-17s and B-24s also supported the effort. General MacArthur watched the entire operation; according to Kenney, MacArthur orbited in a B-17 overhead "watching the show and jumping up and down like a kid."¹¹³ Though Kenney describes the eight guns in the nose of the aircraft, he was most likely referring to B-25C/D aircraft with four nose-mounted machine guns with two machine guns mounted on each side of the fuselage. The B-25G did not have enough guns to meet Kenney's description and the B-25H began production in August 1943 and likely was not in the Southwest Pacific Theater in large enough numbers for this raid.¹¹⁴

In a similar raid, the B-25s attacked four airfields around Rabaul on 18 October 1943. The B-25s, assisted by Australian Beaufighters, attacked all the airfields simultaneously. They destroyed over 100 aircraft on the ground and heavily damaged another 51. The Japanese were only able to get 30 to 35 aircraft airborne. The escorting P-38s shot down nearly all the Japanese aircraft, scoring 26 kills.¹¹⁵

Kenney became increasingly confident and comfortable with the Allied Air Force's tactics and aircraft, so much in fact that he turned down General Arnold's request to send him the brand new Douglas A-26, meant to replace the B-25 and A-20. Kenney told Arnold "the equipment [he] had was good enough to win the war and [he] did not want to start

¹¹³ Cleary, Gideon Oral History Interview, 27; James, "Oral Reminiscences," 29; Kenney, *General Kenney Reports*, 293; Stephens, "George C. Kenney," 96; Wolk, "Other Founding Father," 170.

¹¹⁴ Doyle, *B-25 Mitchell in Action*, 54.

¹¹⁵ Kenney, *General Kenney Reports*, 313-314.

testing and experimenting with the new A-26 this late in the game.”¹¹⁶ Rather than looking for new aircraft, Kenney continued to focus on innovative ideas to find success. Some ideas, such as aircraft and bomb modifications were very successful. Others, like dropping bombs into a volcano crater to get it to erupt, did not pan out.¹¹⁷ Despite the occasional failure, the innovative environment contributed materially to Allied success.

Kenney continued to gather praise and success in the Southwest Pacific Theater. Eventually he gave up command of the Fifth Air Force to command the Far East Air Forces, which included the Fifth Air Force, the Thirteenth Air Force, the Royal Australian Air Force, and the Royal New Zealand Air Force. Later, the Seventh Air Force fell under his control as well.¹¹⁸ President Roosevelt recommended Kenney for his fourth star saying Kenney “more than earned it.”¹¹⁹

Throughout the war in the Pacific, General George C. Kenney’s innovative ideas and leadership fostered the environment for the evolution in B-25 design. Furthermore, he approached his command with what Alan Stephens describes as “an unsentimental appreciation of Realpolitik, or of dealing with the world as it is rather than how we might like it to be.”¹²⁰ This appreciation for reality helped Kenney prioritize his requirements within the theater and his requests from the US. Kenney’s ability to gain support from General Hap Arnold set the wheels of technological development in motion and North American Aviation began building B-25s to meet combat requirements. All B-25 versions following the modification of the B-25C and Pappy Gunn’s visit to Wright Field and North American Aviation followed from his leadership.

¹¹⁶ Kenney, *General Kenney Reports*, 532.

¹¹⁷ Rodman, *A War of Their Own*, 82.

¹¹⁸ Kenney, *General Kenney Reports*, 405.

¹¹⁹ Kenney, *General Kenney Reports*, 532.

¹²⁰ Stephens, “George C. Kenney,” 67.

Kenney's leadership extended from his subordinates to his superiors. While commenting on an award for Kenney, General MacArthur said:

General Kenney is one of the world's outstanding air leaders. His resourcefulness, his ingenuity, his aggressiveness, and his loyalty have made his services invaluable. He has air vision, by which I mean an understanding of the almost limitless potentialities of air development. . . . The Imaginative boldness with which General Kenney approaches this great subject is only one of the qualities which has so greatly endeared him to me. No living man will probably contribute more to the air age which is now upon us.¹²¹

One final comment emphasizes the trust and value MacArthur had for Kenney. On 25 November 1944, MacArthur told Kenney about a remarkable coincidence. MacArthur described a story from the Civil War saying, "When Stonewall Jackson was dying, the last words he said were, 'Tell A.P. Hill to bring up his infantry.' Years later when Lee died, his last words were, 'Hill, bring up the infantry.'" MacArthur then continued, "If I should die today, or tomorrow or any time, if you listen to my last words you'll hear me say, 'George, bring up the Fifth Air Force.'"¹²²

General Kenney brought something the Allied Air Forces were missing under his predecessor. He reorganized the forces, making them more efficient and supportive of a larger goal. The "Europe First" policy forced Kenney to rely on innovative solutions to maximize the effectiveness of his limited forces against the realities of a harsh battle space. Kenney created a place where innovators had a voice and could make change. Not all efforts were successful, but the evolution of the B-25 brought with it strategic success as demonstrated in the Battle of the Bismarck Sea. Kenney's top-down innovative leadership style fostered

¹²¹ Kenney, *General Kenney Reports*, 351.

¹²² Ahmann, Barnes Oral History Interview, 262; Kenney, *General Kenney Reports*, 464-465.

an environment where innovative ideas could grow. He needed help to bring his grand ideas into reality, men who had ideas and the ability to innovate on their own. One of these men was Captain Paul I. “Pappy” Gunn.

Chapter 3

Bottom-Up Innovation—Major Paul I. “Pappy” Gunn



Figure 11: Paul I. Gunn in *Pappy's Folly*

Source: John P. Henebry, *The Grim Reapers at Work in the Pacific Theater: The Third Attack Group of the U.S. Fifth Air Force* (Missoula, Montana: Pictorial Histories Publishing Company, Inc., 2002), 67.

He was one of the great heroes of the Southwest Pacific in World War II, a mechanical genius, and one of the finest storytellers I have ever known. His deeds were real. His stories were often fantasies but they and the recital of his actual accomplishments will be told and retold as long as any of his comrades-in-arms are still alive and then will be handed down to succeeding generations of airmen. Pappy Gunn is already a legendary figure.

General George C. Kenney

The previous chapter described General George C. Kenney's contributions to the process of top-down innovation in the development of attack aviation in the Southwest Pacific Theater. This chapter takes the opposite approach. It focuses on one individual, Paul Irvin Gunn.

Gunn, while working almost exclusively at the unit level, contributed to B-25 innovation in a different way during a similar time. His work ethic, energy, and unique capabilities created effects throughout World War II in the Pacific.

Paul Irvin Gunn was born in Quitman, Arkansas on 18 October 1899. His father passed away when he was in the sixth grade.¹ At that point, he left school and worked to support his family. When Gunn was 13 years old, he began helping a mechanic who fixed and upgraded cars used by moonshine runners. Gunn became his apprentice, anticipating the mechanic's needs and eventually helping with the work. The mechanic taught him how the car worked, and Gunn's natural ability took over. Eventually, the moonshine runners brought their cars in to Gunn, asking him to make them run faster. While he worked on others' cars, he gathered the parts from two wrecked cars and put the parts together to make "the fastest car in the hills around Quitman, Arkansas."²

Eventually, Gunn began delivering moonshine on his own. He made twelve deliveries over the 35-mile distance between Quitman and Searcy, Arkansas without any problems. His thirteenth run changed the course of his life. While running from the police, he came upon a roadblock and the sheriff caught him. He was 17 years old. The judge gave him a choice; go to reform school, or join the US military. Gunn decided to join the Navy. The judge allowed Gunn to spend only one day

¹ John S. Alcorn, "The Grim Reapers: Part I," *American Aviation Historical Society Journal* vol. 20, no. 1 (Spring 1975), 15; Carl J. Barger, *Cleburne County and Its People: Volume 1* (Bloomington, IN: AuthorHouse, 2008), 277; George C. Kenney, *The Saga of Pappy Gunn* (New York: Duell, Sloan, and Pearce, 1959), 9; Note: Kenney suggests Gunn was actually born in 1900, but lied about his age so he would not need parental consent to enter the Navy. This is likely inaccurate because he entered the Navy as a result of his run-in with the law for a moonshine offense when he was 17 years old.

² Peter Dunn, "Paul Irvin 'Pappy' Gunn in Australia During WW2," *Australia at War*, <http://www.ozatwar.com/ozatwar/pappygunn.htm> (accessed 15 April 2013); Nathaniel Gunn, *Pappy Gunn* (Bloomington, IN: AuthorHouse, 2004), 2-3; Sam McGowan, "They Called Him Pappy!" <http://www.sammcgowan.com/pappy.html> (accessed 15 April 2013).

with his family before boarding a train as a Navy recruit. Before he left, his mother offered him guidance that stuck with him for the remainder of his life; “Son, always remember what your father taught you. Run towards trouble, never away from it, and your honor is the most important thing in your life.”³ Though Gunn’s early years appear to be a story of a downtrodden young man, these experiences became the foundation of Gunn’s innovative, bottom-up creative instincts that served him well in the years to come.

P.I. Gunn, as his Navy counterparts came to call him, boarded a train with three other Navy recruits and set off for the Great Lakes Naval Training Center near Chicago, Illinois. One month after graduating from basic training, he started his Navy career at the Great Lakes Training Center as a Cook, Second Class. Not only was he not qualified to be a cook, the rank was inappropriate for a brand new Seaman. Gunn’s superiors recognized the error saying, “Somewhere out there, floating around in this man’s navy, is a Cook Second Class being treated like a recruit, while you are enjoying the benefits of his experience and rating.”⁴ They agreed to try to fix the error, but Gunn worked in the kitchen until they worked it out. He excelled in his duties in the kitchen and eventually the Navy recognized his mechanical skills and transferred him (with appropriate rank) to the motor pool at Pensacola Naval Air Station, Florida.⁵

Gunn’s new job was not what he expected. He spent most of his time cleaning up around the motor pool and never worked on any of the vehicles. One day he delivered a truck to the seaplane ramp. He saw two machinist mates working on a seaplane engine. He was fascinated and offered to lend a hand. Shortly thereafter, the two Machinist Mates stood back and Gunn took the lead. He fixed an engine that had been

³ Gunn, *Pappy Gunn*, 3-4; McGowan, “They Called Him Pappy!”

⁴ Dunn, “Paul Irvin ‘Pappy’ Gunn,” Gunn, *Pappy Gunn*, 22-24; McGowan, “They Called Him Pappy!”

⁵ Gunn, *Pappy Gunn*, 28; McGowan, “They Called Him Pappy!”

giving them trouble for days. Observing the situation, the squadron commander walked over to Gunn and told him he was being transferred immediately to become an aviation mechanic. Gunn's earlier work on car engines and a knack for all things mechanical led to his introduction to naval aviation.⁶

In 1921, the US Navy attempted to sell a nearly destroyed single engine seaplane. Gunn and a friend bought the plane, initially planning to sell it for scrap. Gunn, however, quickly decided he could fix the aircraft. Once he had it running, a friend taught him how to fly.⁷ Gunn reached the end of his enlistment in 1923. The Navy offered Gunn an opportunity to reenlist in a program for enlisted pilots. He earned his wings in 1925 and became a fighter and seaplane pilot. His mechanical expertise and flying experience served him well and his peers recognized him as an excellent pilot.⁸ The traits that made Gunn a hugely influential figure in World War II were beginning to show. His experience and gift for engines moved him into aircraft maintenance; however, buying an inoperable plane in 1921 represented something different. His instincts and motivation to do things most people would not even consider helped him transition from working on the planes to flying them himself.

Even as a pilot, P.I. Gunn could not stop tinkering. While stationed at Anacostia Naval Air Station near Washington, DC he helped work on the Navy's plan to launch seaplanes from cruisers using a catapult. The first catapults used an explosive charge. Gunn volunteered to pilot the first test launch. The catapult launch was successful and Gunn landed the plane undamaged; however, Gunn was not so lucky. The explosive charge was so powerful he sustained two

⁶ Gunn, *Pappy Gunn*, 29-31; McGowan, "They Called Him Pappy!"

⁷ Dunn, "Paul Irvin 'Pappy' Gunn;" Gunn, *Pappy Gunn*, 32, 42; McGowan, "They Called Him Pappy!"

⁸ Barger, *Cleburne County*, 277; Gunn, *Pappy Gunn*, 42; McGowan, "They Called Him Pappy!;" Kenney, *Saga of Pappy Gunn*, 25.

hernias and medical personnel carried him from the aircraft to the hospital. The Navy redesigned the catapult, eventually moving to a steam-powered version that became the common design for US Navy ships.⁹

The catapult created a problem for the Navy. They could launch aircraft, but could not recover them. Gunn again volunteered to work with a crew to design a crane to lift the aircraft back onto the catapult and again flew one of the first tests. After departing off the catapult and landing near the ship, Gunn connected the seaplane to the crane. While the seaplane lifted out of the water, the ship moved in an ocean swell and the aircraft hit the ship. Gunn broke his nose and all of his front teeth were loose. A Navy doctor wired the teeth in place, but every morning until 1937 Gunn had to wiggle his loose teeth back into place. In 1937, he went to a dentist of Japanese descent and had all of his teeth pulled and had false teeth installed in their place.¹⁰ The same Japanese dentist came to his aid later in World War II.

While working on an aircraft in New Guinea in 1943, Gunn's false teeth fell to the tarmac and broke. The flight surgeon could not fix the teeth, but offered some glue for him to use. Gunn took the glue back to his tent and found a package from the Japanese dentist. Inside, a note from the dentist suggested that he figured Gunn would need a new set soon, so he took the liberty of making a new set. The new teeth required some work to make them fit, but Gunn filed them down and he had a new set of teeth, just in time.¹¹ P.I. Gunn's injuries are not necessarily important to the development of the B-25; however, his work ethic, even in the face of danger and injury, demonstrate the internal drive recognized by others throughout his life.

⁹ Barger, *Cleburne County*, 277; Gunn, *Pappy Gunn*, 47; Kenney, *Saga of Pappy Gunn*, 23.

¹⁰ Gunn, *Pappy Gunn*, 48-49; Kenney, *Saga of Pappy Gunn*, 26.

¹¹ Gunn, *Pappy Gunn*, 202-204.

P.I. Gunn and his family spent 12 years at Pensacola Naval Air Station, Florida and Anacostia Naval Air Station, Washington, DC before moving to the Naval Air Station at Pearl Harbor, Hawaii in 1934.¹² During a five-year period in Hawaii, Gunn was a workaholic. He focused most of his time making extra money to support his family and always had at least one additional job outside the Navy. The jobs were normally flying or mechanic work. While in Hawaii, Robert Tyce hired Gunn as a flight instructor and charter pilot for the Knox-Tyce Flying Service. He also managed some of the operations of the small airline. He remained at this job until he retired from the Navy on 31 December 1939 as a Chief Petty Officer.¹³ At this point, he was an experienced pilot, mechanic, and understood the operations of a small airline. This opened the door for his next opportunity, in the Philippines.

In 1939, Gunn moved himself first, and then his family, to an area outside Manila, Philippines. He helped start Philippine Air Lines at Nichols Field and worked as the operations manager and a pilot for their small fleet of twin-engine Beechcraft transport planes. Others recognized Gunn for his “unusual skill and experience, and practically unlimited resourcefulness.”¹⁴ His 21 years of maintenance, flying, and operations experience with the US Navy and working side jobs served him well as he became one of the most experienced pilots in the Philippines. The Gunn family lived happily in the Philippines until rumors of war circulated in 1941. Thus, on the eve of World War II in the Pacific, Gunn was a 42-year-old retired Navy pilot working successfully in his second career.

¹² Barger, *Cleburne County*, 277; Gunn, *Pappy Gunn*, 50-51.

¹³ Alcorn, “The Grim Reapers: Part I,” 15; Barger, *Cleburne County*, 277; Dunn, “Paul Irvin ‘Pappy’ Gunn,” Gunn, *Pappy Gunn*, 53-54.

¹⁴ Alcorn, “The Grim Reapers: Part I,” 15; Dunn, “Paul Irvin ‘Pappy’ Gunn,” Walter Dumaux Edmonds, *They Fought with what They Had: The Story of the Army Air Forces in the Southwest Pacific, 1941-1942* (Boston, MA: Little, Brown, & Company, 1951), 142; Kenney, *Saga of Pappy Gunn*, 29; Steven Wilson, “Pappy Gunn’s B-25s Part 1,” Military.com, <http://www.military.com/features/0,15240,96616,00.html> (accessed 15 April 2013).

On 8 December 1941 (7 December in Hawaii), P.I. Gunn was flying. His family heard about the Japanese attacks on Pearl Harbor and the death of Gunn's former employer, Robert Tyce, on the radio. Gunn learned of the attack in Hawaii as well as an attack on Clark Field in the Philippines and raced back to Nichols Field to be with his family. He thought Nichols Field would be a target for the Japanese in the very near future.¹⁵

Gunn tried to convince his wife to move with the four children into Manila. He thought they would be safe from Japanese bombing. His wife refused, fearing others would loot their house. He prepared the family and some supplies in case the Japanese attacked Nichols Field. Nichols Field was a well-known air depot in the Philippines and had large buildings and infrastructure that were easy targets for Japanese bombers. Gunn was correct about the Japanese. They attacked the morning of 9 December 1941. After securing his family, Gunn followed his father's advice from his childhood and ran towards the trouble.¹⁶

Gunn's decision to run to the airfield would change the rest of his life. While there, two things happened. First, he discovered the Japanese had lightly damaged the Philippine Air Lines aircraft and he decided to move them to a safer location. He selected a place in the nearby Grace Park Cemetery. The Japanese never discovered or damaged these aircraft on the hidden airfield.¹⁷ While Gunn was securing the Philippines Air Lines aircraft, he was also offering his help to the Army Air Forces. The Far East Air Forces commander, Major General Lewis H. Brereton, commandeered the Philippines Air Lines

¹⁵ Gunn, *Pappy Gunn*, 62; Hawaii.gov, "The Attack on Pearl Harbor" Hawaii Aviation: An Archive of Historic Photos and Facts, <http://hawaii.gov/hawaiiaviation/world-war-ii/december-7-1941> (accessed 15 April 2013); Kenney, *Saga of Pappy Gunn*, 30; Tom Risen, "World War II Veteran Sells His Pearl Harbor Plane" *Victorville Daily Press*, 8 June 2008, <http://www.vvdailypress.com/news/adelanto-7609-war-harbor.html> (accessed 15 April 2013).

¹⁶ Edmonds, *The Fought with what They Had*, 27; Gunn, *Pappy Gunn*, 65-66.

¹⁷ Dunn, "Paul Irvin 'Pappy' Gunn;" Edmonds, *They Fought with what They Had*, 142-143; Kenney, *Saga of Pappy Gunn*, 31.

aircraft and verbally inducted Gunn into the Army Air Forces as a captain. Gunn never received any written notification or confirmation of his induction into the AAF. The paperwork was officially filed on 15 December 1941. Brereton ordered Gunn to establish an air transport squadron. In the following weeks of December, Gunn flew sortie after sortie under constant threat of air attack in his unarmed Beechcraft transports, bringing food and supplies north to the troops in the Philippines and evacuating high-ranking officers and dignitaries to south to Australia.¹⁸

¹⁸ Alcorn, "The Grim Reapers: Part I," 15; Dunn, "Paul Irvin 'Pappy' Gunn;" Edmonds, *The Fought with what They Had*, 142,143; Gunn, *Pappy Gunn*, 72; John P. Henebry, *Grim Reapers at Work in the Pacific Theater: The Third Attack Group of the U.S. Fifth Air Force* (Missoula, Montana: Pictorial Histories Publishing Company, Inc., 2002), 55; History, 21st Troop Carrier Squadron, January 1942—January 1944, USAF Historical Research Agency, Micfilm A0971; Kenney, *Saga of Pappy Gunn*, 30-31.

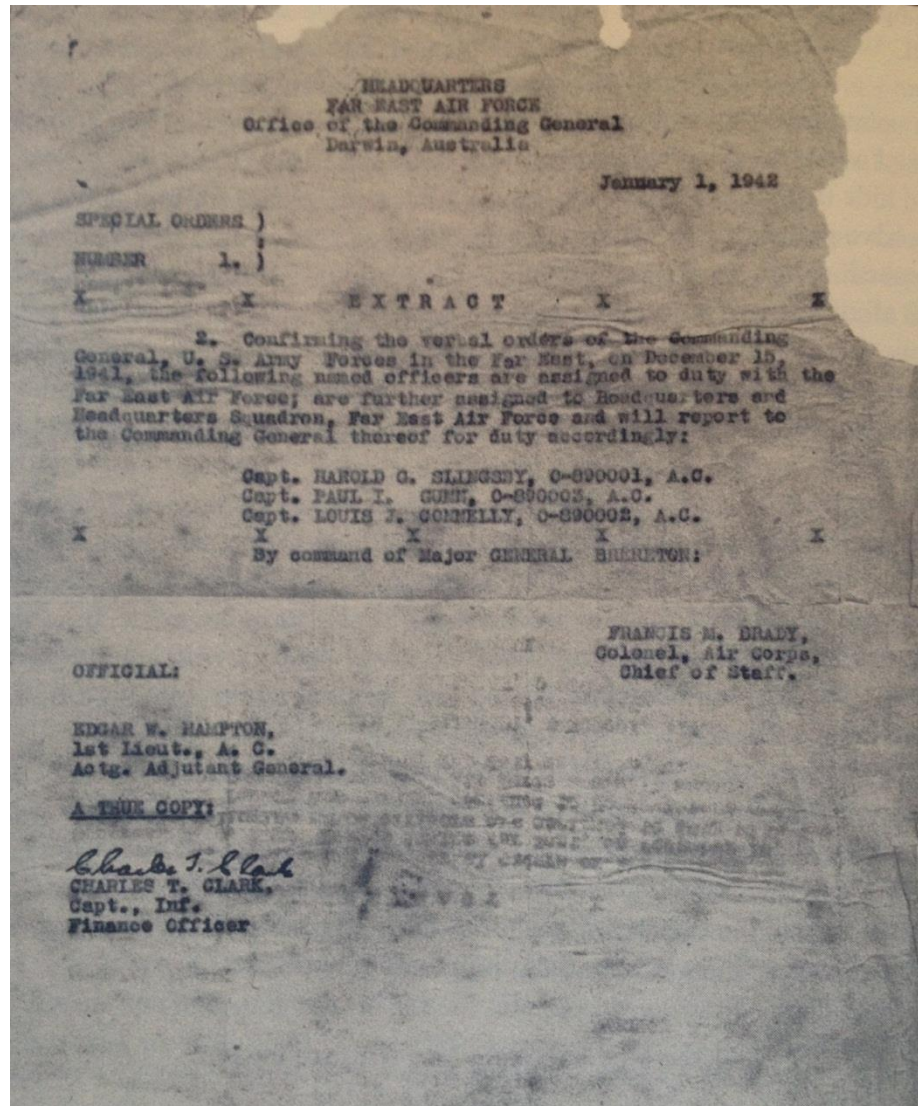


Figure 12: Captain Paul I. Gunn's Induction into the AAF

Source: Nathaniel Gunn, *Pappy Gunn* (Bloomington, IN: AuthorHouse, 2004), 72.

While Gunn focused on his new duties in the AAF, he did not forget his family. He secured a duplex with another family in Manila and sent six Filipino men to help move the family into the city. He instructed his family to stay there and to tell the Japanese he died in the air attack if they were captured. He worried the Japanese would treat them poorly if they learned he was fighting with the Allies. Later, he commandeered a giant tank like the ones used to hold fuel and had it delivered to the

family home. He had some of his men cut a hatch in it and build racks to sit and sleep upon inside it. It was large enough for several families to join the Gunns in their makeshift bomb shelter.¹⁹ Throughout his life, Gunn continued to show his affection for two things: aviation and his family.

With his family secure, Gunn focused all his time on flying. He had several other pilots working with him, but he flew all the toughest missions himself. He flew under constant threat of Japanese air attack and friendly fire from the ground. He learned to fly low, never climbing above 500 feet to avoid both friendly and Japanese threats. On 13 December 1941, a Japanese A6M2 Zero attacked Gunn's Beechcraft transport and he was barely able to keep it airborne. As he tried to make it back to his base, the Philippine Air Force mistakenly directed their anti-aircraft guns at him, further damaging the aircraft. He crashed the aircraft on Nichols Field, but was unharmed. The flights in the last days of 1941 convinced Gunn of the advantages of low-level flight.²⁰ He learned the tactic made his aircraft harder to see and attack from both the air and the ground. He worked to convince others of the benefit of these tactics throughout the war.

The Japanese cornered US Army forces on the Bataan Peninsula and the island of Corregidor the first week of 1942. On 2 January 1942, the Japanese occupied Manila, captured the Gunn family, and held them at Saint Tomas University.²¹ During this time, Gunn gathered any aircraft he could and his haphazard transport service became the Air Transport Command with Captain Paul I. Gunn as its commander. His

¹⁹ Gunn, *Pappy Gunn*, 70.

²⁰ Dunn, "Paul Irvin 'Pappy' Gunn;" Edmonds, *The Fought with what They Had*, 143-145; Kenney, *Saga of Pappy Gunn*, 33.

²¹ Alcorn, "The Grim Reapers: Part I," 15; Dunn, "Paul Irvin 'Pappy' Gunn;" Bruce Gamble, *Fortress Rabaul: The Battle for the Southwest Pacific, January 1942-April 1943* (Minneapolis, MN: Zenith Press, 2010), 299; Gunn, *Pappy Gunn*, 78-79; Henebry, *The Grim Reapers*, 55; Kenney, *Saga of Pappy Gunn*, 35; The Sydney Morning Herald, "Manila Occupied by Japanese," *Trove Digitized Newspapers*, 3 January 1942, <http://trove.nla.gov.au/ndp/del/page/1106653?zoomLevel=3> (accessed 17 April 2013).

new command included six C-53s, three Beechcraft transports, three B-24s, three B-18s, and one B-17. Some accounts suggest he may have also had several DC-2 and DC-3 civilian transports.²² December 1941 and January 1942 brought two wars to Paul Gunn. He would fight them simultaneously. He fought one war for the United States. The other was his personal war with the Japanese to rescue his family.²³

Gunn continued to run what became the 21st Transport Squadron until 28 April 1942. Throughout the spring, Gunn continued taking exceptional risks delivering supplies in his unarmed transports to Bataan and evacuating military members and civilians from a variety of locations in the Philippines. His contributions were not limited to ferrying passengers and cargo. On 7 January 1942, a load of P-40s arrived in Brisbane on a ship. They required some assembly before they could fly north to Java. Unfortunately, there were no assembly instructions or experienced maintenance personnel to make the aircraft flyable. Gunn organized a work crew, assembled the P-40s, and flight-tested them before clearing them to fly to Java. Like many of his flights and innovations, Gunn did not ask for permission, he just did it. The P-40 pilots were inexperienced navigators, especially over long stretches of water. Gunn's experience gave them an outlet. At the beginning of the war, most of New Guinea and many of the other Pacific islands lacked useful maps or were unexplored. General George C. Marshall once remarked, "as far as the Pacific was concerned, if you got a sketch, you were lucky."²⁴ "Pappy had the reputation of being a homing pigeon and

²² Gunn, *Pappy Gunn*, 84; History, 21st Troop Carrier Squadron; McGowan, "They Called Him Pappy!;" Note: According to the 21st Troop Carrier Squadron's official history, all flyable, but non-combat capable aircraft were to be used for airlift, including bombers.

²³ Edmonds, *They Fought with what They Had*, viii; Gamble, *Fortress Rabaul*, 299; George C. Kenney, *Saga of Pappy Gunn*, vii.

²⁴ Mark C. Cleary, Lieutenant General Robert G. Ruegg Oral History Interview, USAF Historical Research Agency, Call: K239.0512-1571, 18; George W. Goddard, General George C. Kenney Oral History Interview, USAF Historical Research Agency, K239.0512-

others called on him often to lead other pilots who were not familiar with the geography of the southwest Pacific.”²⁵ Alone in his Beechcraft, Gunn escorted 18 P-40s through hostile skies to Java. He returned to Darwin, Australia where he procured the B-17 mentioned above. He flew four more trips between Darwin and Java delivering supplies. On his last trip, he spotted a Japanese fleet near Java. Though his crew was not trained for bombing, he loaded bombs on the aircraft and flew seven missions against the Japanese fleet. He started at 3,000 feet, but repeatedly missed the ships. On his sixth and seventh flights, he flew at just over 100 feet, remembering his Navy tactics. According to his stories, the large naval guns shut down below 18 degrees of elevation to keep them from shifting out of their moorings. He flew low on the last two passes so only the smaller naval guns could threaten his B-17. In fact, the aircraft did sustain damage, but Gunn also succeeded in damaging two large transport ships. Gunn’s experience on this day and his days in the Navy sparked the innovation he later employed in his modifications of the A-20 and B-25. Gunn was a man who would do whatever it took to get the mission accomplished. Often Gunn loaded his aircraft well beyond its maximum weight to ensure he carried every person, piece of cargo, or morale-building food and drink the aircraft could fit inside on many occasions. For these and other actions, the 3rd Bombardment Group commander recommended Gunn for the Distinguished Service Cross.²⁶

During these early months of the war, Paul I. Gunn earned the name he would carry with him for the rest of his life. At the relatively old age of 42, he was considerably older than the other men, had far more

1011; Henebry, *Grim Reapers*, 34; History, 21st Troop Carrier Squadron; Stephens, “George C. Kenney,” 82.

²⁵ Kenney, *Saga of Pappy Gunn*, 40-41.

²⁶ Dunn, “Paul Irvin ‘Pappy’ Gunn;” Edmonds, *The Fought with what They Had*, 145; Gunn, *Pappy Gunn*, 94, 98, 100-102; Kenney, *Saga of Pappy Gunn*, 37-40; McGowan, “They Called Him Pappy!,” Geoffrey Perret, *Winged Victory: The Army Air Forces in World War II* (New York: Random House, 1993), 148.

experience, and told the tall tales of an elderly gentleman. Those that knew him, and eventually many who only heard of his exploits, called him “Pappy.”²⁷

On 28 April 1942, the Allied Air Forces commander, Lieutenant General George H. Brett verbally removed Pappy from command of the 21st Transport Squadron. Pappy moved from his assignment in Brisbane, Queensland to his new assignment with the 3rd Bombardment Group (BG) in Charters Towers, Queensland. There are two possible reasons for this move. First, while Pappy was doing great work in the transport business, he wanted to be able to fight back at the Japanese and exact his revenge on them for taking his family. Second, Pappy had been spending time with the 3rd BG’s maintenance personnel. He also met and became friends with the 3rd BG commander, Colonel Jim Davies. Davies saw the work Pappy did on the P-40s and was happy to have a man like him in his unit.²⁸

Shortly before moving over to the 3rd BG, Pappy’s extreme motivation, sharp thinking, and general disregard for authority figures created a golden opportunity for the 3rd BG. While looking for machine shops to make parts for his transport aircraft, he spotted two-dozen brand new B-25s sitting on a parking ramp at Bachelor Field, near Melbourne. The 3rd BG was waiting on a shipment of B-25s but they had not arrived. Pappy went directly to Colonel Davies and demanded he let Pappy go back to Bachelor Field with some crews and pick up the aircraft. The B-25s were for the Dutch East Indies Air Force, but there were no Dutch crews to fly the aircraft. The stories vary in exactly how Pappy procured the aircraft, but they generally agree on the following points. Davies initially told Pappy they could not go and steal the

²⁷ Edmonds, *They Fought with what They Had*, 142; Gunn, *Pappy Gunn*, 80; Kenney, *Saga of Pappy Gunn*, 30; McGowan, “They Called Him Pappy!”

²⁸ Alcorn, “The Grim Reapers: Part I,” 15; Dunn, “Paul I. ‘Pappy’ Gunn,” Gamble, *Fortress Rabaul*, 299; Gunn, *Pappy Gunn*, 103; Kenney, *Saga of Pappy Gunn*, 43; McGowan, “They Called Him Pappy!”

aircraft from the Dutch. Davies noted that Pappy was exhausted from his flight and needed to rest. Pappy exploded at his superior and demanded Colonel Davies take the issue to the Far East Air Forces Bomber commander and “ask him, beg him, threaten him, but come back with authorization to pick up our planes from Melbourne!”²⁹

Colonel Davies relented and agreed to talk to the bomber commander, Major General Eugene Eubank. Eubank eventually conceded and offered an authorization for Davies to pick up the 3rd BG’s B-25s (not the Dutch aircraft). If the Army personnel holding the aircraft for the Dutch released the aircraft to Davies, it would be their fault, not the fault of the 3rd BG. Pappy, Davies, and the B-25 crews flew to Bachelor Field, and with authorization in hand, left with the aircraft. While refueling at Archer Field in Brisbane, they ran into their first bit of trouble. The base commander arrived with military police in tow to regain control of the aircraft. Pappy interjected when Davies attempted to explain the situation with Eubank’s authorization and dressed down the base commander. Pappy told him bluntly that the planes were going north with the 3rd BG to fight the Japanese. The commander replied, “You must be Pappy Gunn . . . I’ve heard about you and I’ll bet you will have them ready to go in a couple of days.”³⁰ Pappy and Colonel Davies succeeded and took the aircraft to Charters Towers. Pappy generally negotiated with firm speech, threat of court martial, or by waving his two .45-caliber pistols in the air. His speech helped him this day, but he would need his pistols to get the aircraft combat ready.

After the B-25s arrived at Charters Towers, they realized the aircraft never had the bombsights installed. Pappy returned to Bachelor Field with his sidekick Sergeant Evans. They visited the Dutch supply clerk and asked for the bombsights. The Dutch officer was irate about

²⁹ Dunn, “Paul Irvin ‘Pappy’ Gunn;” Gunn, *Pappy Gunn*, 104-106; McGowan, “They Called Him Pappy!”

³⁰ Alcorn, “The Grim Reapers: Part I,” 7; Dunn, “Paul Irvin ‘Pappy’ Gunn;” Gunn, *Pappy Gunn*, 108-109; McGowan, “They Called Him Pappy!”

the loss of the aircraft when, in the middle of his rant, Pappy pulled out his pistols. The Dutch officer relented and when Pappy had his bombsights, the officer asked if his name was Pappy Gunn. After Pappy replied in the affirmative, the Dutch officer said, "We have heard many stories of your bravery. It was not so nice to meet you but I am happy to have done so."³¹ Despite the variations in this story, the 3rd BG did "acquire" B-25s from the Dutch and the legend of Pappy Gunn's exploits continued to grow.³²

Soon after acquiring the B-25s, Davies and Pappy received a call to report to a superior's office. They assumed they would receive a reprimand for taking the aircraft. Instead, they discussed a mission to attack the Japanese in the Philippines. They had one problem. The B-25s did not have the range to make the trip. In four days, Pappy Gunn designed, installed, and tested a long range, droppable fuel tank for the aircraft.³³ This was the first step toward many future aircraft modifications.

The 3rd BG flew the A-20 Havoc as well as the B-25. The aircraft was a fast light bomber. Like its larger siblings, the A-20s had little success bombing airfields or shipping from medium and high altitudes. Moreover, the .30-caliber machine gun in the nose of the aircraft was ineffective against Japanese fighters who were learning to attack Allied aircraft from head-on due to limited forward firepower. Many of the A-20s arrived in Australia without their bomb racks, so they idly sat awaiting the shipment. Pappy took the opportunity to attack all these problems in the already fast and nimble A-20. He installed four .50-caliber machine guns in the nose, eliminated the bombardier position, and installed long-range fuel tanks. Pappy was building the first strafer

³¹ Gunn, *Pappy Gunn*, 110; Kenney, *Saga of Pappy Gunn*, 44; McGowan, "They Called Him Pappy!"

³² History, Thirteenth Bomb Squadron, USAF Historical Research Agency, Call: SQ-BOMB-13-HI, Micfilm A0540, Frame 2182.

³³ Alcorn, "The Grim Reapers: Part I," 8; Gunn, *Pappy Gunn*, 116.

of the Pacific War.³⁴ These modifications foreshadowed the metamorphosis of the B-25 from a medium bomber to a commerce destroyer.

Pappy made some enemies during this time. He was using “a little force and threats to get the equipment [he] needed.”³⁵ This was Pappy’s normal manner of doing business when he encountered resistance, but it did not endear him to the supply personnel in Australia. An Army officer complained and had Pappy removed from the A-20 modification process. Colonel Davies was able to reinstate Pappy after a few weeks.³⁶

Pappy met a man who helped spread Pappy’s legend even further in the spring of 1942, after Pappy and Davies acquired the B-25s from the Dutch. The Technical Representative for North American Aviation Corporation, Jack Fox, watched a B-25 circle over Charters Towers and execute a perfect landing. Fox knew that there should not be any B-25s at Charters Towers and went to talk to the crew. The crew, however, did not emerge. Pappy Gunn, alone, stepped from the aircraft. Fox asked Pappy where he got the aircraft and how he learned to fly it. In Pappy’s typically crass tone, he let Fox know he taught himself how to fly the B-25, he flew it alone, and he got the aircraft from the Dutch. Fox was just the kind of man Pappy needed. He lived in a world between the manufacturer and the crews that flew the airplane. He could, and would fly the airplanes in the Pacific, but also worked on them with the maintenance personnel. He passed recommendations back to North American Aviation, and received information for field modifications from the manufacturer. Fox had the expertise to get the Dutch B-25s ready

³⁴ Alcorn, “The Grim Reapers: Part I,” 12; Eric M. Bergerud, *Fire in the Sky: The Air War in the South Pacific* (New York: Basic Books, 2000), 289; Cleary, Ruegg Oral History Interview, 26; Timothy D. Gann, *Fifth Air Force Light and Medium Bomber Operations During 1942 and 1943: Building Doctrine and Forces that Triumphed in the Battle of the Bismarck Sea and the Wewak Raid* (Air University: School of Advanced Airpower Studies, 1992), 10; Kenney, Diary, 5 August 1942 and 13 August 1942.

³⁵ Mark C. Cleary, Lt Gen Francis C. Gideon Oral History Interview, USAF Historical Research Agency, K239.0512-1338, 44; Cleary, Ruegg Oral History Interview, 25.

³⁶ Cleary, Ruegg Oral History Interview, 25-26.

for combat and they soon became great friends. They eventually called their operation the South American Aviation Company, a play on the name of the B-25 manufacturer. They built a sign for their “headquarters” and official letterhead for their correspondence with other agencies and the manufacturer.³⁷

Pappy Gunn’s first engineering drawings for a B-25 strafer are dated 1 June 1942.³⁸ The drawing depicts four .50-caliber machine guns in the nose of the aircraft and two machine guns on each side of the fuselage. This armament replaced the single .30-caliber flexible machine gun housed in the B-25 nose. Lieutenant General Robert G. Ruegg later suggested that Pappy “was the one that really was the key force in putting more firepower in [the 3rd BG] airplanes. There wasn’t anything he couldn’t do or he didn’t think possible.”³⁹ The date on this drawing is important because it is over two months prior to General George Kenney’s arrival in the Southwest Pacific Theater and introduction to Pappy on 5 August 1942. Therefore, despite many writings to the contrary, Kenney did not dream up the B-25 strafer alone. Pappy’s modifications to the A-20 and his initial drawings for the B-25 indicate that he, with Jack Fox, adapted the aircraft to the mission requirements in the Southwest Pacific Theater.

³⁷ Alcorn, “The Grim Reapers: Part I,” 14; Victor Boesen, “Wizard with a Wrench,” *Colliers Magazine*, 19 August 1944, 24; Gunn, *Pappy Gunn*, 112-113; Sheehan, *Fiery Peace*, 35.

³⁸ Gunn, *Pappy Gunn*, 138.

³⁹ Cleary, Ruegg Oral History Interview, 26-27.

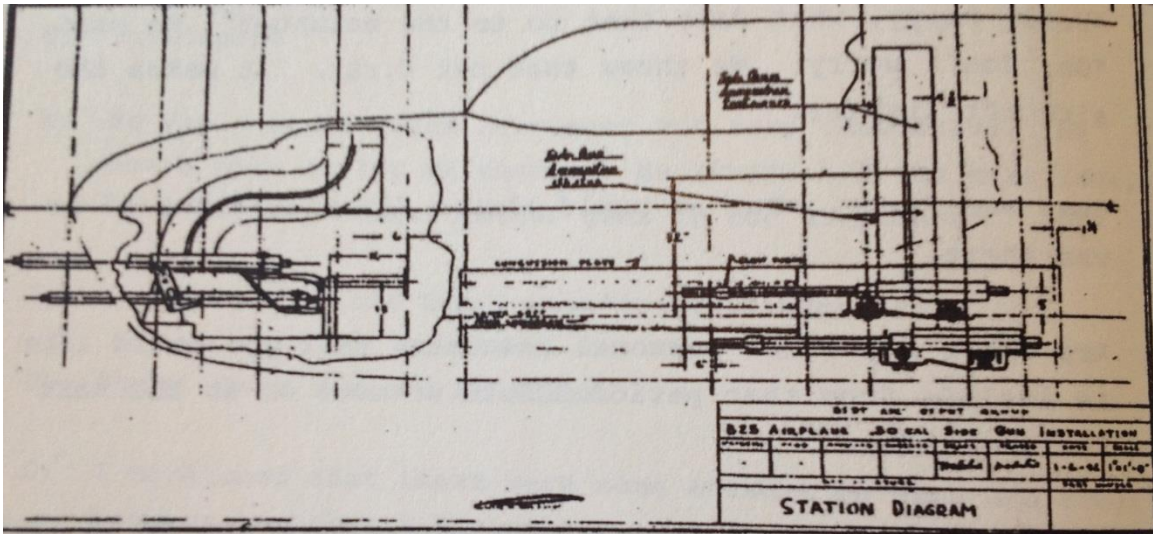


Figure 13: B-25 Modification Sketch, 1 June 1942

Source: Nathaniel Gunn, *Pappy Gunn* (Bloomington, IN: AuthorHouse, 2004), 187.

These modifications represented an evolution in the crews' thinking about bombardment. J. Leland Atwood, the head designer for North American Aviation Corporation, later recounted, "The targets were more tactical than strategic—including supply ships and beach installations—so some very creative people in the Air Corps, especially 'Pappy' Gunn . . . took the lead in changing the mission into an attack mode and installed eight forward-firing .50-caliber machine guns which made the plane very effective for attack purposes."⁴⁰ If the evidence indicates the initial B-25 modifications were the brainchild of Pappy Gunn, then why does General Kenney often get the credit? Certainly, Kenney deserves credit for his leadership role and facilitating an environment supporting such endeavors. Pappy, however, did not seek any credit. In fact, he avoided any contact with the media or overt credit for his heroic actions on the ground or in the air. He feared the

⁴⁰ J. Leland Atwood, "North American Aviation's B-25 Mitchell Design: Foreword," in *Pappy Gunn*, Nathaniel Gunn (Bloomington, IN: AuthorHouse, 2004), 139.

Japanese might learn of his exploits, realize he was alive, and punish his family.⁴¹

On 18 July 1942, the AAF promoted Pappy Gunn to major, just weeks before he met Kenney. When they met, Kenney saw, first-hand, Pappy's ongoing modifications to the A-20. Kenney was surprised, and excited, to find a man who did not wait for permission, but acted to improve the situation with his own initiative. Furthermore, Kenney told Colonel Davies he could keep Pappy for two more weeks, after which he was to report to the headquarters in Brisbane to be Kenney's special projects officer. Davies was not happy about losing Pappy, but the move offered Pappy an opportunity; he would see a lot more of Jack Fox and they established their South American Aviation Corporation in Brisbane.⁴²

Though Pappy Gunn is the focus of this chapter, Kenney took advantage of other bottom-up innovators to help solve his problems. In August 1942, Kenney received another innovative solution from one of his enterprising sergeants. The sergeant was from one of the B-25 squadrons and described five B-25s that were not flyable due to a lack of wheel bearings. He told Kenney of a B-25 that had crashed but not burned in the jungle. He suggested they mount an expedition to find the aircraft (which lay in Japanese controlled territory) and retrieve any undamaged equipment they could. Kenney approved the plan and the sergeant and his team returned with the equipment from the B-25 as well as another crashed fighter aircraft they found along the way. "Three days later, five B-25s and three P-39 fighters joined the list of aircraft in combat commission."⁴³ Kenney found solutions to a myriad of problems

⁴¹ Gunn, *Pappy Gunn*, 207; Lieutenant General Robert G. Ruegg, "Interview with Nathaniel Gunn," in *Pappy Gunn*, Nathaniel Gunn (Bloomington, IN: AuthorHouse, 2004), 141.

⁴² Gunn, *Pappy Gunn*, 187, 191; Kenney, Diary, 5 August 1942; Kenney, *Saga of Pappy Gunn*, 48, 50-51.

⁴³ Kenney, Diary, 5 August 1942; Kenney, *General Kenney Reports*, 71-73.

by harnessing bottom-up ideas from subordinates like the sergeant and Pappy Gunn.



Figure 14: Paul I. Gunn and the South American Aviation Corporation Headquarters

Source: Nathaniel Gunn, *Pappy Gunn* (Bloomington, IN: AuthorHouse, 2004), 192.

After Pappy Gunn moved to Brisbane, he continued his work modifying the 3rd BG A-20s. They started with the A-20s because they were easier and faster to modify than the B-25s. By early September 1942, the A-20's firepower was having an effect on Japanese ground targets and bases. The finished product included four .50-caliber machine guns in the nose, two .30 caliber machine guns on each side of the fuselage, and a 450-gallon fuel tank in the bomb bay to increase the A-20's range. Whenever possible, Pappy flew his modified aircraft before anyone else to ensure its airworthiness. Captain Ed Larner assisted Pappy on many of these flights and during the modifications. Larner became Kenney and Pappy's lead demonstrator of low-level attack tactics

for the crews. Larner perfected his skills in the A-20 with the lessons Pappy had learned in the Navy and while flying his own low-level bombing missions in the Pacific. When Larner once questioned Pappy's low-level tactics, Pappy replied, "For twenty years, the Navy taught me how to attack enemy ships and what they would do if I did. You have been trained to drop your bombs from four thousand feet, and you probably know more about that than I do. . . . Trust me, this is the way to do it."⁴⁴

Kenney gave Gunn permission to begin B-25 modifications in the middle of November 1942. Pappy had an initial aircraft ready for demonstration by the middle of December. The test was a huge success and Kenney told Pappy to convert 12 more B-25s to equip a unit. The B-25 used in testing were B-25C1s and had four .50-caliber machine guns in the nose and two .50-caliber machine guns on each side of the fuselage. With the top turret locked forward, this gave the B-25C1 strafers ten .50-caliber machine guns with which to assault its target.⁴⁵

Kenney sent Larner to Charters Towers to show the crews the new B-25 and made Larner the squadron commander for the B-25 straferequipped 90th BS. The word about Pappy's B-25 modifications was spreading through the Pacific. Major General Millard "Miff" Harmon, the AAF commander in the Pacific Theater, heard about the modifications. He sent a plane over for Pappy to modify and to use as an example for the Seventh Air Force B-25s.⁴⁶ One factor that was critically important to Pappy's success was Kenney's influence on the supply depots in Australia. Kenney and Pappy met shortly after Davies reinstated Pappy

⁴⁴ Alcorn, "The Grim Reapers: Part I," 12; Gann, *Fifth Air Force Light and Medium Bomber Operations*, 10-11; Gunn, *Pappy Gunn*, 207, 208-209.

⁴⁵ Gann, *Fifth Air Force Light and Medium Bomber Operations*, 10-12; Gunn, *Pappy Gunn*, 209; Kenney, *Saga of Pappy Gunn*, 56-57; Lex McAuley, *Battle of the Bismarck Sea* (New York: St. Martin's, 1991), 20; Neil Sheehan, *A Fiery Peace in a Cold War: Bernard Schriever and the Ultimate Weapon* (New York: Vintage Books, 2009), 35.

⁴⁶ George C. Kenney, *General Kenney Reports: A Personal History of the Pacific War* (New York: Duell, Sloan, and Pearce, 1949), 165, 173.

at Charters Towers. Kenney's determination to streamline the supply process ensured Pappy got the supplies and had access to the machine shops he needed to make the modifications.

Pappy Gunn filed a report for his tests on 8 January 1943. Then on 10 January, he sent a letter to North American Aviation with pictures of his projects and requested the return of Jack Fox, the "inefficient illiterate and broken down operations manager" for South American Aviation Corporation. Furthermore, he requested that the small-framed Fox be "stretched or blown up to normal size."⁴⁷ Pappy's communications were often full of humorous remarks woven within his true message, if there was one. He also included a picture (see below) drawn by another Army officer of "Pappy Gunn's Future B-25 Project;" it was an artist's rendering of Pappy's now famous capabilities.⁴⁸

⁴⁷ Gunn, *Pappy Gunn*, 209-210; Henebry, *Grim Reapers*, 48.

⁴⁸ Gunn, *Pappy Gunn*, 211; Henebry, *Grim Reapers*, 50.

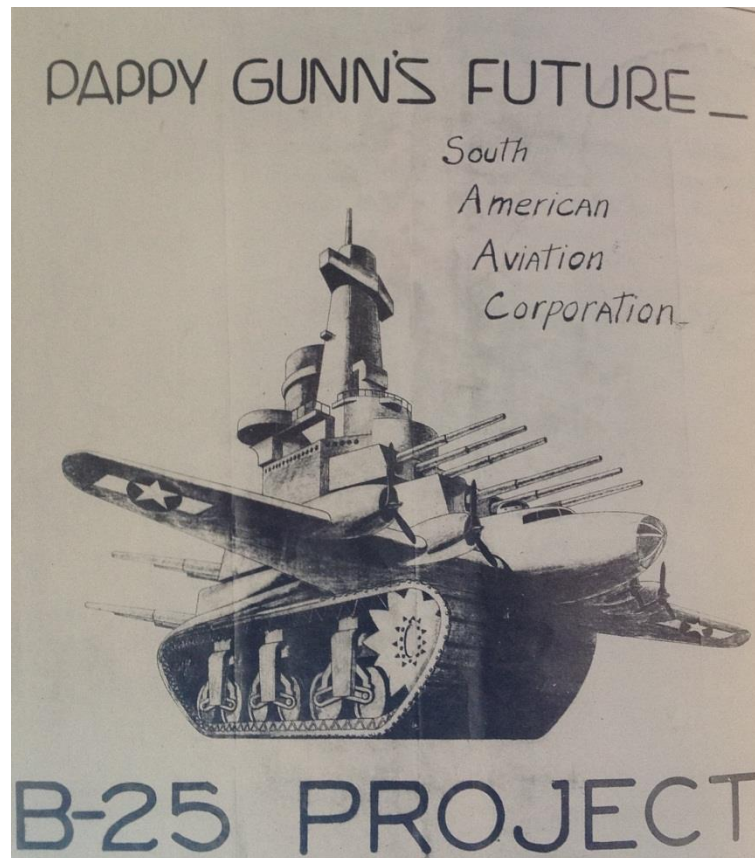


Figure 15: Pappy Gunn's Future B-25 Project

Source: John P. Henebry, *The Grim Reapers at Work in the Pacific Theater: The Third Attack Group of the U.S. Fifth Air Force* (Missoula, Montana: Pictorial Histories Publishing Company, Inc., 2002), 50.

During January and February 1943, the crews learned how to fly the new B-25 strafer. They practiced on the wreck near Port Moresby. When 3 March 1943 arrived, the crews were ready, but apprehensive. This would be their first confrontation with armed Japanese ships. They worried about the effectiveness of the forward firing guns that would allow them to fight their way into their skip-bombing release point. Larner led the mission and “when they saw Larner’s B-25 open up with his ten fifties, the result was instantaneous. The fire from the ship stopped as if a switch had been thrown, stopping all action aboard.” At least one of his four bombs smashed into the side of the ship. With

restored confidence, the other crews engaged their targets and won a stunning victory in the Battle of the Bismarck Sea.⁴⁹

Kenney left the Pacific the day after the battle. After conferring with General Arnold, he agreed to send Pappy back to the US for a month. Pappy arrived on 1 April 1943 and proceeded to the Engineering Division at Wright Field. General Arnold wanted the officers there to learn from Gunn's wartime experience. Pappy spent about a week at Wright Field. He was often frustrated with the garrison lifestyle and he felt "it did not appear . . . it had the proper tone of activity in comparison to that on the front lines."⁵⁰ After Pappy's visit to Wright Field, the engineers agreed "that it had been an interesting week and that [Gunn] had brought home to them quite vividly the differences between fighting the war in New Guinea and in Dayton, Ohio."⁵¹

While Pappy was visiting Wright Field, he took a trip to Eglin Field, Florida with Major General Thomas Gerrity. While in Florida, they had the chance to fly a newly modified B-25. This aircraft had a 75-mm cannon installed in the nose. Pappy often gets credit for inventing this weapon, but in fact he saw it for the first time during this visit. He left Eglin Field excited to try the cannon in combat.⁵² He would get his chance in the near future.

Pappy Gunn left Wright Field to spend about three weeks at the Inglewood, California North American Aviation B-25 production facility. While there, he not only talked to the engineers about how to modify the aircraft, he went to the assembly lines and demonstrated how to do it

⁴⁹ Alcorn, "The Grim Reapers: Part II," 189; Gunn, *Pappy Gunn*, 236; Henebry, *Grim Reapers*, 60-61.

⁵⁰ Alcorn, "The Grim Reapers: Part I," 15; Major General Thomas P. Gerrity, Project Officer: B-25, B-26, B-29, B-32, B-35, & B-36 Aircraft, Army Air Corps Materiel Command, to General George C. Kenney, Commander, Allied Air Forces, letter, 26 August 1958; Gunn, *Pappy Gunn*, 248.

⁵¹ Kenney, *Saga of Pappy Gunn*, 62.

⁵² *Aircraft Accident and Incident Reports: 1940 thru 1948*, General Services Administration, National Archives and Records Services, World War II Records Division, USAF Historical Research Agency, Micfilm 46185 (43-3-31-12); Cleary, Ruegg Oral History Interview, 27; Gerrity to Kenney, letter; Gunn, *Pappy Gunn*, 251.

himself.⁵³ Pappy's insight provided North American Aviation with "much valuable background for design of new airplanes to meet realistic combat conditions."⁵⁴ Pappy even improved upon his original designs. By the time he left California, the B-25 had two more .50-caliber guns in its nose for a total of six, while retaining the two machine guns on each side of the fuselage.⁵⁵ He left California and returned to New Guinea around 1 May 1943. The Inglewood, California facility ceased B-25C production the month Pappy left, so his innovations were most likely used in the B-25D aircraft produced in Kansas City, Kansas. B-25D production continued in Kansas until March 1944.⁵⁶

⁵³ Alcorn, "The Grim Reapers: Part I," 15; Kenney, *Saga of Pappy Gunn*, 66.

⁵⁴ Aircraft, Army Air Corps Materiel Command, to General George C. Kenney, Commander, Allied Air Forces, letter, 26 August 1958; Gunn, *Pappy Gunn*, 253.

⁵⁵ Kenney, *Saga of Pappy Gunn*, 66; Rodman, *A War of Their Own*, 83.

⁵⁶ David Doyle, *B-25 Mitchell in Action* (Carrollton, TX: Squadron/Signal Publications, 2011), 39.



Figure 16: Lieutenant Colonel Paul I. Gunn and Mrs. Gunn with James H. "Dutch" Kindleberger at the Inglewood, CA North American Aviation Facility

Source: Noel Tunney, *Winning from Downunder* (Brisbane, Australia: Boolarong Press, 2010), 62.

To say Pappy Gunn was extremely busy from the start of the war until May 1943 is a gross understatement. Kenney and Davies frequently mentioned Pappy working through the night or looking exhausted. Kenney describes a rare moment where Pappy decided to catch up on a personal issue after his return from the US. Pappy arrived in Kenney's office asking if he could have a pair of wings for his uniform like Kenney and the other pilots wore. Kenney dismissively suggested he go to the Post Exchange and buy a set. Pappy explained to Kenney that he did not have an AAF pilot's rating. Kenney was shocked, knowing that Pappy had flown nearly every airplane in the theater and had over 100 combat missions by this time. Pappy also had not been drawing flight pay. Kenney went directly to General Arnold's staff to fix the situation, but was rebuffed. He then went directly to Arnold who gave

Pappy a pilot's rating effective 7 December 1941. After five months flying in combat, modifying aircraft, and showing the AAF and North American Aviation the modifications required for the B-25 commerce destroyer, Pappy was finally a legal AAF pilot.⁵⁷

Pappy would not slow down for anything. His injuries in the Navy were a preview of what would come in the Pacific. While working on a plane, he broke his little finger. He had the doctors in Brisbane splint it at least three times, but he would always rip off the splint when it got in the way of his work. He eventually decided the finger was more trouble than it was worth and he could work on the aircraft and manage the aircraft throttles better without it. He asked the veterinarian (he always referred to the doctors as veterinarians) to cut it off. Naturally, the doctor refused and told Pappy he must slow down for a few weeks while the finger healed properly. Taking a break was not an option for Pappy. He replied in his typically aggressive fashion. The details of this conversation vary, but Pappy threatened to either cut off the finger with a knife or shoot it off with his pistol. He figured that once the finger was gone the "veterinarian" would have to fix him up. The doctor, seeing the crazy man in front of him, relented and he amputated Pappy's little finger. The doctor was frustrated the next day when he learned Pappy was already out flying without his "wicked digit." There are two stories that explain what happened to that finger. One story depicts Pappy's sense of humor. He did not want anyone to suggest he had lost his finger in the Southwest Pacific. Therefore, he kept his finger in a small jar and carried it with him. If anyone suggested he had "lost" his finger, he would produce it and show them he knew exactly where it was! A second story suggests his fellow Airmen had a formal funeral ceremony for the finger and placed it under a headstone of mahogany with a carved

⁵⁷ Kenney, *Saga of Pappy Gunn*, 70-71.

inscription that said, "The Wicked Digit of Pappy Departed This Life October 20, 1943. Requiescat in Pace."⁵⁸

A B-25G like the one Pappy flew at Eglin Field arrived in the Southwest Pacific Theater in July 1943. By this time, Pappy was not allowed to fly in combat because Kenney and others thought he was too valuable to lose. On 9 July 1943, Pappy wrote a letter asking for permission to test the aircraft. He was concerned the 75-mm cannon removed too many of the .50-caliber machine guns from the nose and might be less effective.⁵⁹

From May to August 1943, North American Aviation's Inglewood facility converted 400 B-25C aircraft to a new model, the B-25G.⁶⁰ General Arnold sent Kenney one of these aircraft to test in combat. Kenney approved Pappy's request and allowed him to put it through some testing on 28 July 1943. The aircraft was named *Lil' Fox*, after Jack Fox. Gunn fell in love with it immediately. The new aircraft included the 75-mm cannon. Gunn took the aircraft and joined a formation of B-25Cs to attack two Japanese destroyers. To Gunn's frustration, his 75-millimeter cannon had little effect on the destroyer and the other B-25s had to take over and sink both ships. On his return flight, Gunn came across an opportunity to let the 75-mm cannon shine. He spotted a Japanese transport aircraft landing on an airfield and shot two 75-millimeter rounds into it. The aircraft disintegrated. Two Japanese generals and three colonels perished in the attack.⁶¹

Gunn's attack on the aircraft foreshadowed the 75-mm cannon's true potential. It was highly useful for ground attack against airfields and troop positions, but not very effective against shipping. In one

⁵⁸ Gunn, *Pappy Gunn*, 352-354; Kenney, *Saga of Pappy Gunn*, 89-90.

⁵⁹ Gunn, *Pappy Gunn*, 267.

⁶⁰ Doyle, *B-25 Mitchell in Action*, 49.

⁶¹ Steve Birdsall, *Flying Buccaneers: The Illustrated Story of Kenney's Fifth Air Force* (Garden City, NY: Doubleday & Company, INC., 1977), 80; Kenney, *General Kenney Reports*, 272-273; McGowan, "They Called Him Pappy!;" Rodman, *A War of Their Own*, 55, 79-80.

example, Japanese soldiers in coconut-log bunkers held up a group of American soldiers. The Americans could not get close to them. A B-25G, armed with the 75-millimeter cannon fired a few rounds, scoring direct hits on the bunkers, allowing the Americans to take control quickly.⁶² Both Kenney and Pappy wanted the B-25G to have more forward firepower. Just as they had done with the B-25C, they added four .50-caliber machine guns to 38 aircraft in less than two weeks.⁶³

Pappy Gunn continued his two wars, modifying and flying aircraft, attacking the Japanese whenever his superiors allowed him to fly, and fighting to get his family back from Manila. A full description of his exploits are beyond the scope of this thesis, but are worthy of a Hollywood movie. His war for the US ended on 30 October 1944. He was on the ground, setting up the Tacloban airfield when the Japanese attacked and a small piece of phosphorous shrapnel burned deep into his arm. The wound was extremely painful and nearly paralyzed his arm for the rest of his life.⁶⁴

Pappy's second war, the one for his family, ended on 1 February 1945. MacArthur's 1st Cavalry Division took control of the Santo Thomas Internment Camp (formerly Santo Thomas University). Importantly, an Airman, Colonel Dave Hutchinson, accompanied the division. His task was simple; find the Gunn family. He found them, all alive, but malnourished and in bad shape. General MacArthur arrived in the camp about two weeks later and met the family. The Gunn family left the internment camp within days of meeting MacArthur. On 19 February, the Gunn family flew to Brisbane to see Pappy in the hospital.⁶⁵

⁶² Kenney, *General Kenney Reports*, 398.

⁶³ Birdsall, *Flying Buccaneers*, 81-82.

⁶⁴ Gunn, *Pappy Gunn*, 370; Kenney, *Pappy Gunn*, 100-101; McGowan, "They Called Him Pappy!"

⁶⁵ Kenney, *General Kenney Reports*, 516-517; Kenney, *Saga of Pappy Gunn*, 103-104, 112; McGowan, "They Called Him Pappy!"



Figure 17: Gunn Family Reunited in a Brisbane Hospital

Source: Nathaniel Gunn, *Pappy Gunn* (Bloomington, IN: AuthorHouse, 2004), 393.

Though Pappy's war was finished before the Allies won their victory, his effect on the war was remarkable and lasting. B-25s continued their evolution, concluding with a hard-nose B-25J strafer with fourteen .50-caliber machine guns.⁶⁶ The stories of Pappy Gunn are legendary and though some have fiction woven in with fact, his impact was real. He changed the aircraft in the Pacific Theater to meet unique requirements. He gave the leaders the tools they needed to move Allied forces to the offensive. Importantly, his unstoppable motivation, disregard for those who stood in his way, and unique capability to dress down senior officers enabled him to change the war from the bottom-up.

Pappy Gunn also deserves some credit for the evolution of skip-bombing and mast-height bombing. He certainly had his own ideas on

⁶⁶ Note: The author's grandfather, Sergeant Robert Smith, was a crew chief and gunner on the B-25J strafer, *Stinky*. His crew attacked the city of Kyushu, Japan while the atomic bomb over Nagasaki destroyed the city.

its relevance in the Pacific theater and played a big role in modifying the aircraft for that purpose and training the crews. As discussed in the previous chapter, however, many people were thinking about skip-bombing at this time. Gunn's efforts made skip-bombing possible, but he did not invent the tactic or introduce it to the Southwest Pacific on his own. In this regard, Pappy was part of an evolution in doctrinal thinking about bombardment and its proper use in the Pacific. He did not act alone, but as one part of bombardment aviation's evolutionary process.

Writers portray Pappy Gunn often as a rogue pilot, acting against doctrinal pressures and the desires of his superiors.⁶⁷ Though his personality and personal tactics were aggressive and productive, he would not have been as successful without the support of others. He did get into trouble on occasion and needed the help of others for his schemes to work. This is where he needed the top-cover of leaders like Colonel Jim Davies and General George Kenney. They provided Gunn the freedom of action to innovate, gave him the resources he needed, and trusted his judgment even when his ideas seemed crazy. Pappy Gunn was an innovator from the bottom levels of the officer corps. He pushed his ideas up the leadership chain and gained the support and admiration of his peers and leaders.

Stephen Peter Rosen might find the story of Pappy Gunn an excellent example of military innovation. Gunn's bottom-up influence, decentralized from the rest of the service, is just what Rosen was describing when he talked about operating units using information readily available to them to execute innovations "without the need for organizational changes elsewhere in their service." Furthermore, Rosen postulates that the control of officer promotions is the source of power in the military. With that in mind, one finds that a single, rogue, junior officer will not have a large effect because he or she does not have the

⁶⁷ Gunn, *Pappy Gunn*; Kenney, *Saga of Pappy Gunn*.

power to make change. Gunn's superiors, with the power of promotion, oversight, and protection, facilitated his innovations with the A-20 and B-25.⁶⁸ Moreover, Gunn's innovations led to the victory at the Battle of the Bismarck Sea and a strategic change in the war as the Allies forced the Japanese into a defensive position from which they would never recover.

⁶⁸ Rosen, *Winning the Next War*, 39.

Summary and Conclusion

The story of the Army Air Forces, North American Aviation Corporation, General Kenney, Pappy Gunn, and the B-25 is one that describes the confluence of a variety of factors and individuals at an opportune point in time. No single factor explains the root cause for B-25 innovation; however, without each of these actors, the innovation associated with the aircraft may never have occurred.

AAF doctrine drove a focus on strategic bombardment. Though attack aviation had been pushed to the background, the AAF had not completely forgotten about it before the start of World War II. Kenney taught attack aviation courses while at the Air Corps Tactical School. Furthermore, the study published in 1942 indicates the AAF was interested in new bombardment tactics against shipping. The AAF also retained stockpiles of the parachute-fragmentation bombs Kenney used in the Southwest Pacific Theater to great effect against the Japanese. Thus, the AAF certainly focused on strategic bombardment, but did not cut ties completely with attack aviation.

North American Aviation Corporation built aircraft in the interwar years to meet Army specifications. The B-25 evolved several times before Jimmy Doolittle led 16 B-25Bs to Tokyo. The B-25s arriving in the Southwest Pacific Theater in 1942 were further improved B-25Cs. North American Aviation is an important factor in the aircraft's development, not only because it was the manufacturer, but also because it was receptive to innovative ideas. The corporation welcomed Pappy Gunn to their Inglewood plant, gave him access to the assembly lines, and embraced his input. This resulted in changes to the B-25D assembly line in Kansas City, providing additional firepower to the new B-25s headed to the Pacific. Furthermore, as their representative, Jack Fox provided a critical link between the operators and the manufacturers.

This undoubtedly assisted Pappy Gunn's modifications as much as it did the manufacturing process in the US. Finally, the B-25G represents an innovation from the US itself. Pappy Gunn often gets credit for the 75-mm cannon, but it was not his idea. He was merely the right man to test it in combat. North American Aviation Corporation was a partner with the AAF and the warfighters in their quest to improve the product and meet real-world requirements, and the powerful "gunship" was a result.

General Kenney played several important roles. He arrived in the Southwest Pacific Theater with a breadth of experience in World War I, in aircraft procurement and manufacturing, attack aviation, Air Force organization, and headquarters staff interactions. Kenney turned several potential negative issues into forces of positive change. Kenney mended the relationship between General MacArthur and his air commander, creating a powerful relationship where MacArthur knew he could depend on his air arm. Certainly the "Europe First" policy hindered Kenney, restricting the flow of men and materiel to his theater. His focus, however, on operators and innovators created an environment where the Allied Air Forces used its limited resources more efficiently and with greater effect. In this effort, he got rid of the individuals and processes creating roadblocks for the Allied Air Forces.

Kenney deserves credit for his role in the development of low-level bombing and the modification of the B-25 into a commerce destroyer. Despite the credit bestowed upon him in many texts, he was not the only man with grand ideas. He did, however, possess outstanding leadership attributes, allowing him to recognize improvements in tactics and the excellence of some of his men. His leadership and support allowed these innovations and innovators to bubble up from lower echelons, solve wartime problems, and achieve strategic effects like those seen at the Battle of the Bismarck Sea.

The Battle of the Bismarck Sea represents justification for Kenney's leadership style and Pappy Gunn's innovative thinking and

bulldog-like manner of getting things done. Pappy Gunn was a rogue in many ways. Those who witnessed his many accomplishments only recorded them after the war. When Pappy saw something he could do, he did it, often without asking or receiving orders. He flew missions in a variety of aircraft, despite lacking an aeronautical rating, based only on his impression that it was the right thing to do. He assembled, modified, tested, and flew aircraft without asking anyone for permission. Pappy modified the A-20 and designed B-25 modifications even before Kenney's arrival. These actions endeared him to his fellow crewmembers, and the effects of his actions gained him the respect of his superiors. It is difficult to say what Pappy Gunn's influence might have been had Kenney not arrived in the summer of 1942. Pappy's innovative ideas and calls to action had a strategic effect at the Battle of the Bismarck Sea. After this point, the Allies transitioned to offensive actions while the Japanese struggled on the defensive through the end of the war. Undoubtedly, Kenney allowed Pappy's ideas to flourish and spread with strategic effect in the Pacific War.

Pappy Gunn's personality also had a lot to do with his success. Pappy was not someone who could take "no" for an answer. Furthermore, he was not afraid of any of his superiors, frequently challenging their decisions. Lastly, his motivation extended beyond his effort to fight for his country. He was fighting for his wife and four children. In many ways, this war and Pappy Gunn were meant for each other. He was the right man to achieve dramatic effects with the experience of his past, the motivation burning within him, and the support of his superiors. Pappy Gunn personifies bottom-up innovation supported by effective leadership.

The introductory chapter referenced Barry Posen's theory of change and innovation in a military organization. Two primary factors are applicable to the evolution of the B-25. First, change is possible when a military maverick teams up with a civilian who has power over

the organization. Second, the military organization would not accept changes unless first proven in combat. The evolution described in the previous chapters suggests two potential mavericks, Gunn and Kenney. It does not offer an outside influence enabling Kenney or Gunn's actions to prevail over organizational inertia. Arnold is a candidate for this role, but his support for ideas like the B-25 modifications generally came after Kenney proved a new capability was worthwhile in combat. Therefore, the first factor does not seem to have played much of a role in the evolution of the B-25. If one considers the actions of Gunn and Kenney as efforts proving the viability of the modified B-25s in combat, then Posen's theory is applicable. Using Posen's theory, one might surmise that Gunn and Kenney bypassed military organizational inertia and forced the organization to accept the B-25 commerce destroyer because of its proven effectiveness. This is demonstrated by Kenney's meeting with Arnold where the engineers from Wright Field condemned the modified B-25 as dangerous to fly. The Battle of the Bismarck Sea provided the combat test needed to bypass the organization's reluctance to accept the aircraft in a strafing and low-level bombing role. While Posen's argument offers some explanatory power, Stephen Rosen's theory offers a more complete and logical explanation.

Rosen discusses wartime innovation and considers the effects of limited resources and limited time in which to make changes. This is the very situation Kenney faced as he took command of the Allied Air Forces in 1942. Rosen also suggests that decentralized innovation can help in this circumstance. Kenney certainly practiced this type of innovation after he arrived in the Southwest Pacific Theater. He removed obstacles to innovation by sending personnel home, removing organizational barriers, and streamlining the command structure. He empowered his subordinates to find innovative solutions. Kenney enabled people like Gunn, waiting for an opportunity to share ideas and make meaningful change, to have a strategic effect on the war from the bottom-up. Kenney

held the power and wielded it effectively, but the real engine for change came from the lower levels of his organization. The evolution of the B-25 in the Southwest Pacific Theater is an excellent example of Rosen's theory.

Wars with limited resources demand innovators to adapt to changing conditions and set the conditions for victory. This innovation grows from both ends of the leadership chain. Commanders provide top-down influence to create opportunities for their subordinates to offer innovative, war winning ideas. The commander's personality alone is not sufficient to create this environment. The commander must foster this environment and modify his chain of leadership in a way that promotes innovation from the youngest Airman to his chief advisor. This effort may not succeed unless the commander identifies his innovators at the lower levels. The commander must have the experience to recognize outstanding individuals and the humility to ask for their help. At the same time, he must support their actions, even after an occasional failure.

Kenney needed an individual like Pappy Gunn to seize upon the environment Kenney built. Gunn had already identified many problems and presented actionable ways to fix them. All Kenney had to do was give Pappy enough freedom to make changes and facilitate their integration into the force with the aid of other capable innovators such as Major Ed Larner, Colonel Jim Davies, and Jack Fox.

Kenney would not have succeeded in the Southwest Pacific Theater without the bottom-up innovation of individuals like Pappy Gunn. He provided a permissive environment, but needed help to enact lasting change. Individuals like Gunn and Larner developed new ways of using the B-25 and mid-level leaders like Davies and Henebry fostered and protected the development of the innovation. The story of the B-25 in the Southwest Pacific Theater is one where effective leadership met dynamic,

bottom-up innovation leading to a strategic impact in a victory over the Japanese in World War II.

This story has meaning for modern United States Air Force officers. Leadership is about more than personality or management skills. It is about fostering an environment and empowering subordinates while protecting them from outside interference. Operation ENDURING FREEDOM in Afghanistan provides unique challenges in this regard. Unit basing and command and control requirements separate senior USAF leaders geographically from most operational units. This means it is as important today as it was in World War II for leaders to foster a supportive environment for innovators at all levels to share ideas and gain senior leader sponsorship for best practices. The geographic separation makes efficient operations analysis, lessons learned, and feedback loops more important than ever. Moreover, commanders at lower levels must be empowered by senior leaders to recognize innovative solutions and forward them up the chain of command for implementation in specific units or consideration across the force.

As Rosen argued, the distribution and allocation of power in the military comes from the ability of a commander to promote his subordinates. In doing this, he has the power to give influence to some subordinates, while taking it away from others. He can support some programs, while ending others. This power must be tempered with humility and the understanding that subordinates and their ideas may offer the key to victory or represent a troublesome distraction. Thus, a commander's job is as much about leadership, direction, and authority as it is about fostering and managing the right environment to let innovative ideas and individuals bubble up from the bottom of the organization.

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